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UNITED STATES NAVAL INSTITUTE PROCEEDINGS

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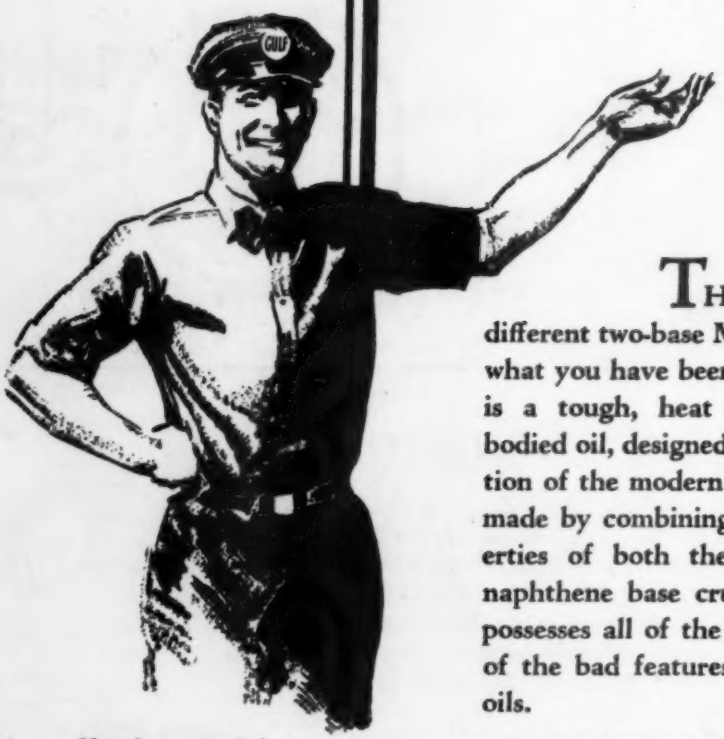

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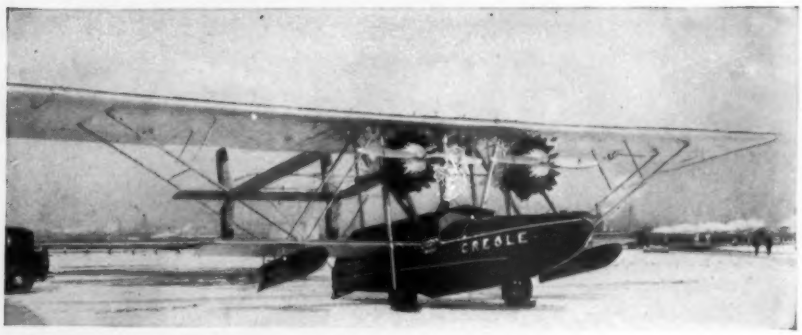

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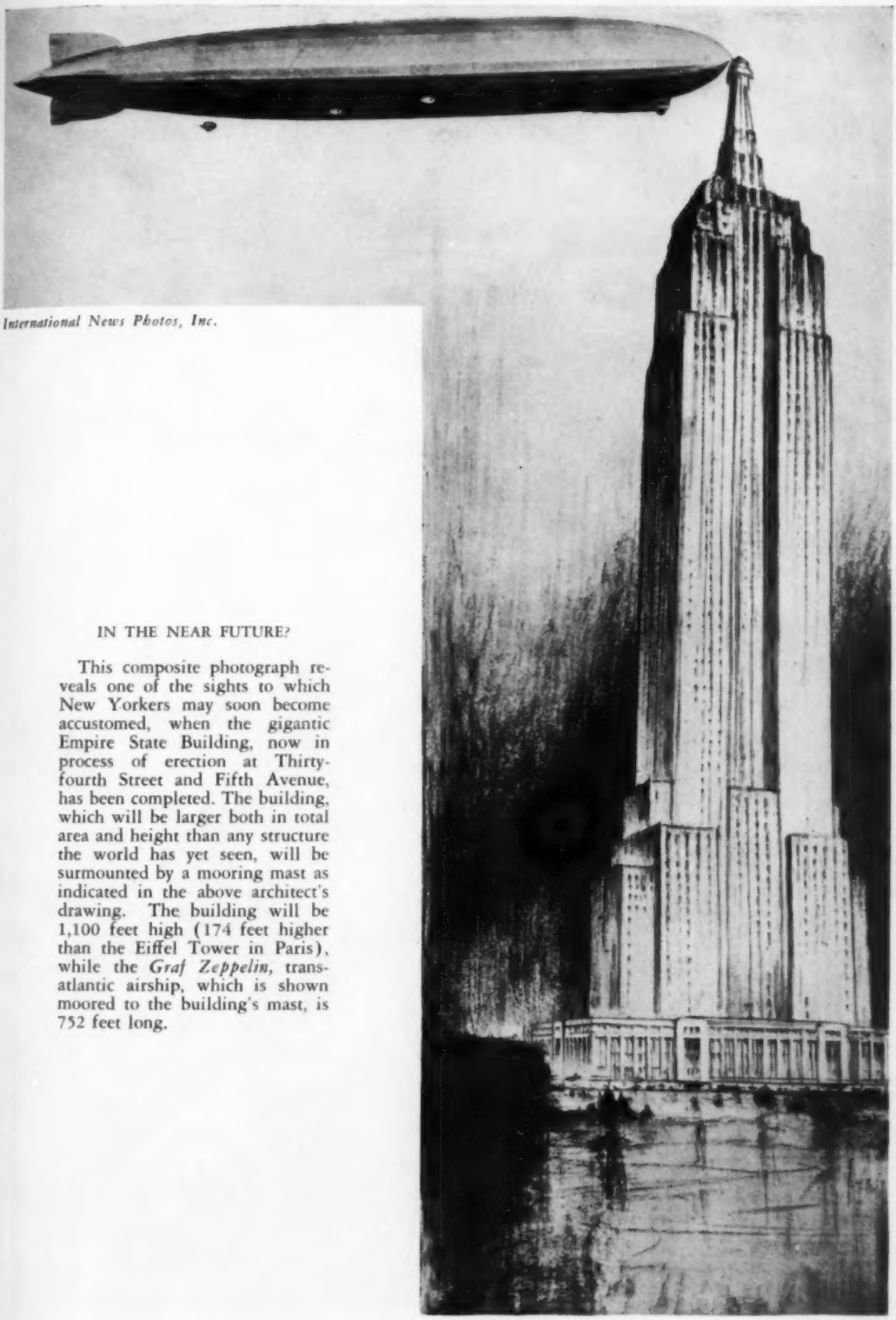

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IN THE NEAR FUTURE?

This composite photograph reveals one of the sights to which New Yorkers may soon become accustomed, when the gigantic Empire State Building, now in process of erection at Thirty-fourth Street and Fifth Avenue, has been completed. The building, which will be larger both in total area and height than any structure the world has yet seen, will be surmounted by a mooring mast as indicated in the above architect's drawing. The building will be 1,100 feet high (174 feet higher than the Eiffel Tower in Paris), while the *Graf Zeppelin,* transatlantic airship, which is shown moored to the building's mast, is 752 feet long.

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NAVAL AIRPLANES READY TO SAIL FOR WINTER MANEUVERS

This aërial view of the North Island Naval Air Station at San Diego, California, shows the line-up of naval planes that embarked February 15 on three aircraft carriers to take part in several "major offensives" against the Scouting Fleet in Atlantic and Pacific waters. The 16,000-mile cruise will end June 21 at San Diego.

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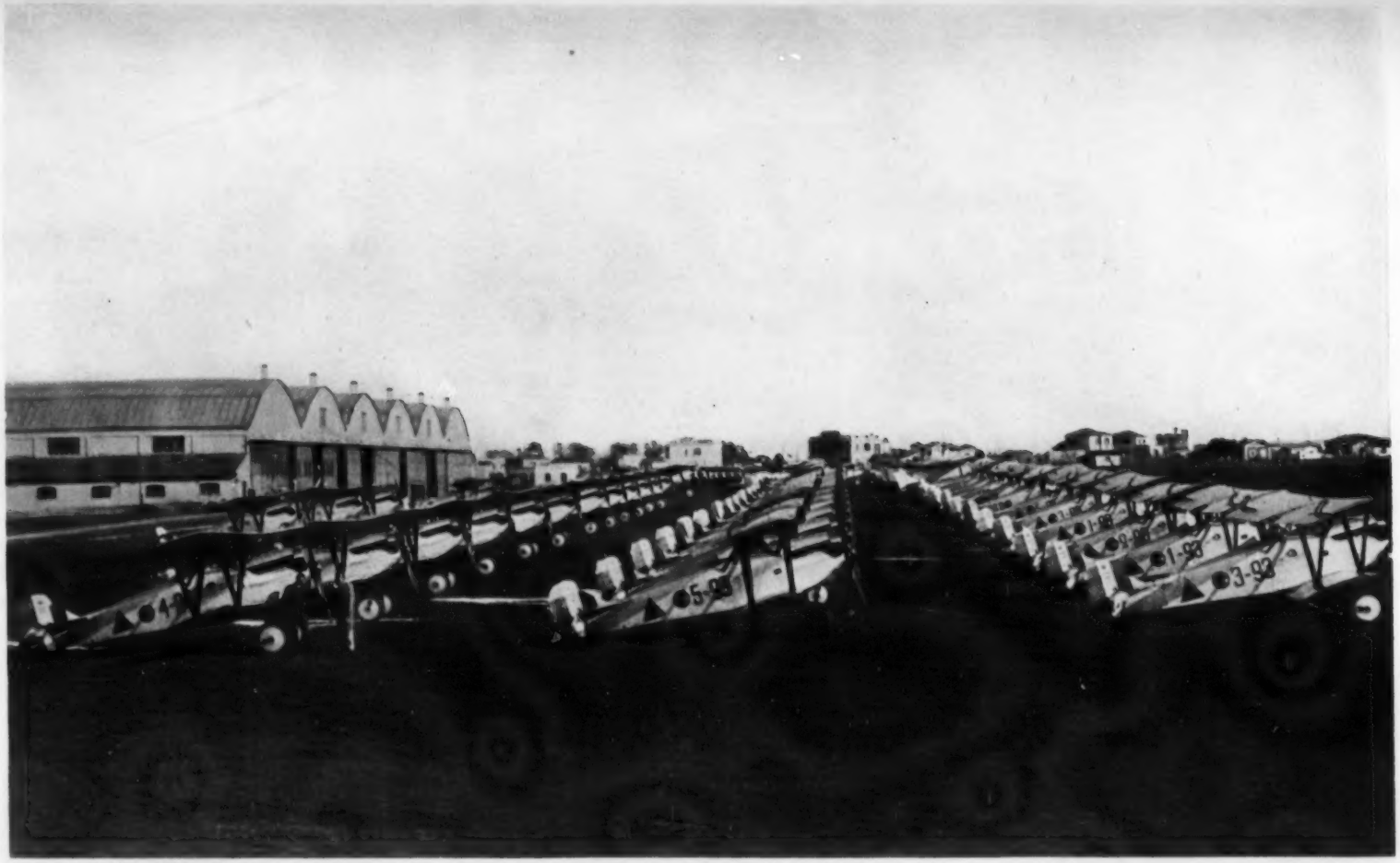

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PART OF ITALY'S AIR FLEET

Three long rows of fleet little biplanes lined up at the airport Di Ciampino. This is part of the fleet that is playing an important part in furthering aviation in Italy for both military and commercial purposes.

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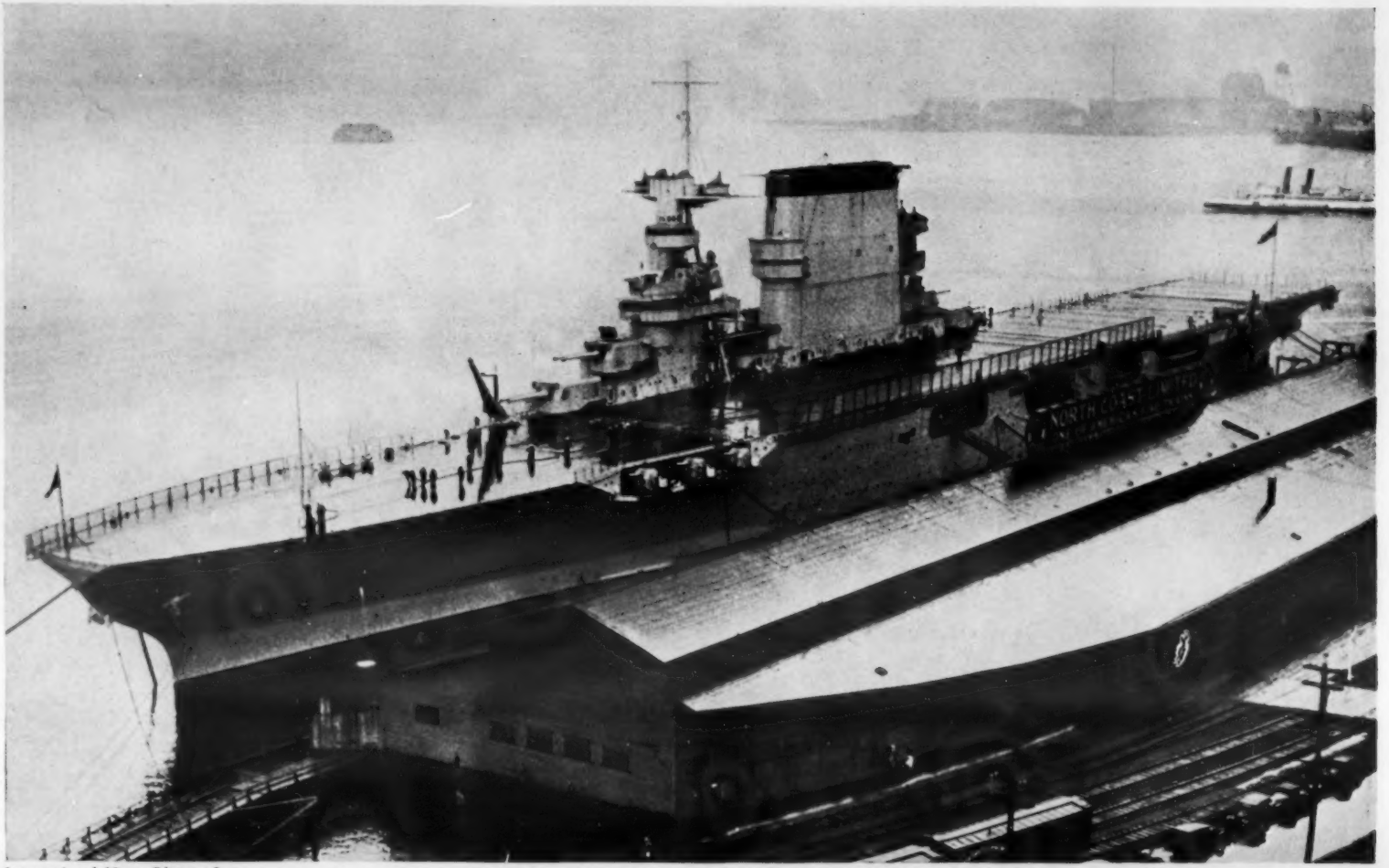

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U.S.S. *LEXINGTON* LENDS POWER TO A CITY

This airplane carrier recently furnished a supply of electricity to the city of Tacoma, Washington. Its giant turbines were put to work in direct connection with the city's power plants. One-fourth of the ship's power was enough to relieve the city's threatened power shortage.

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AMERICA'S LARGEST LANDPLANE TAKES TO THE AIR

Spectators viewing the Fokker F-32, largest landplane in America, a few moments before it took to the air in its first test flight, which proved highly successful. The F-32 has seats for thirty passengers, two pilots, and accommodations for baggage, steward service, and mail.

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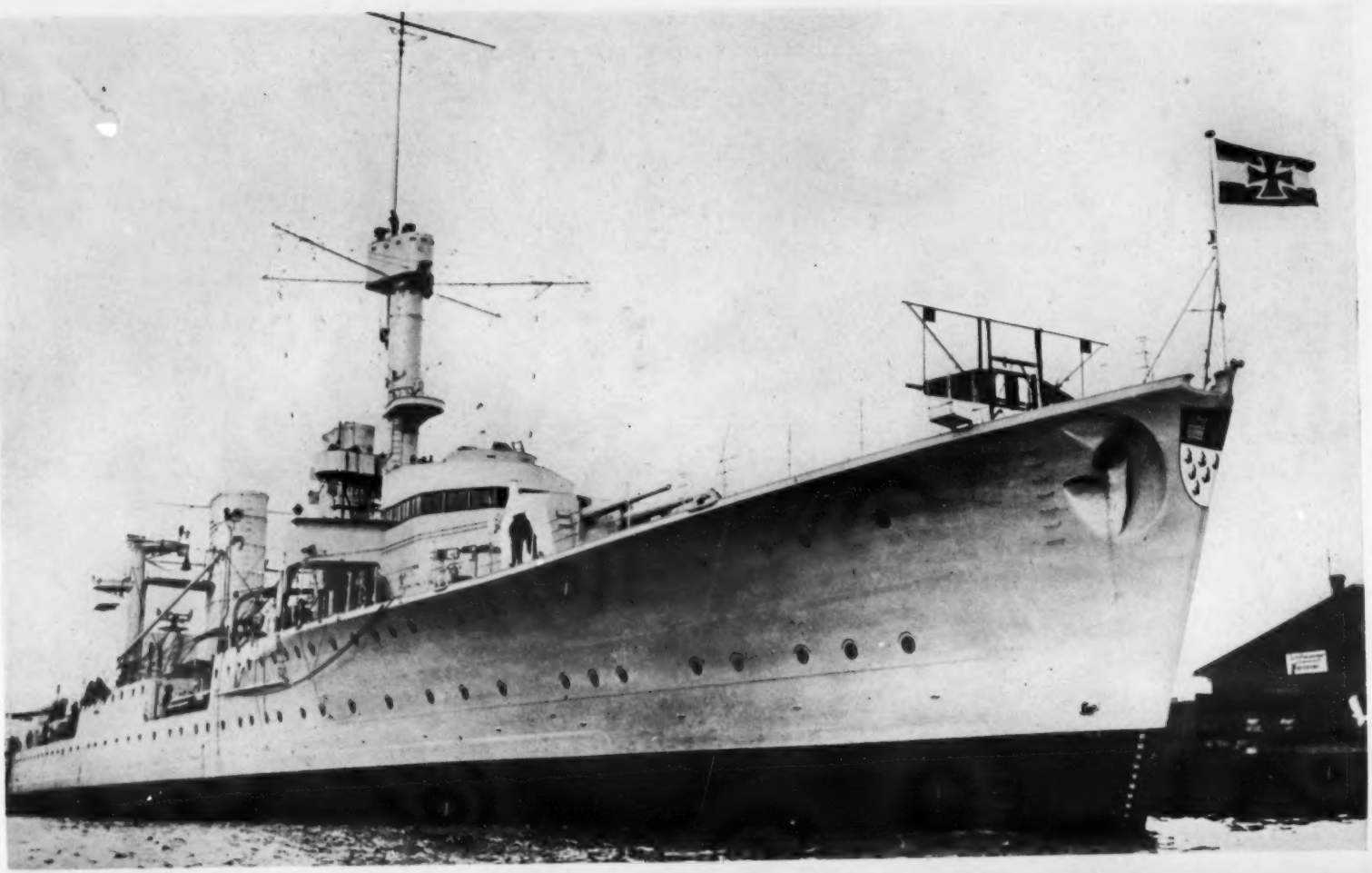

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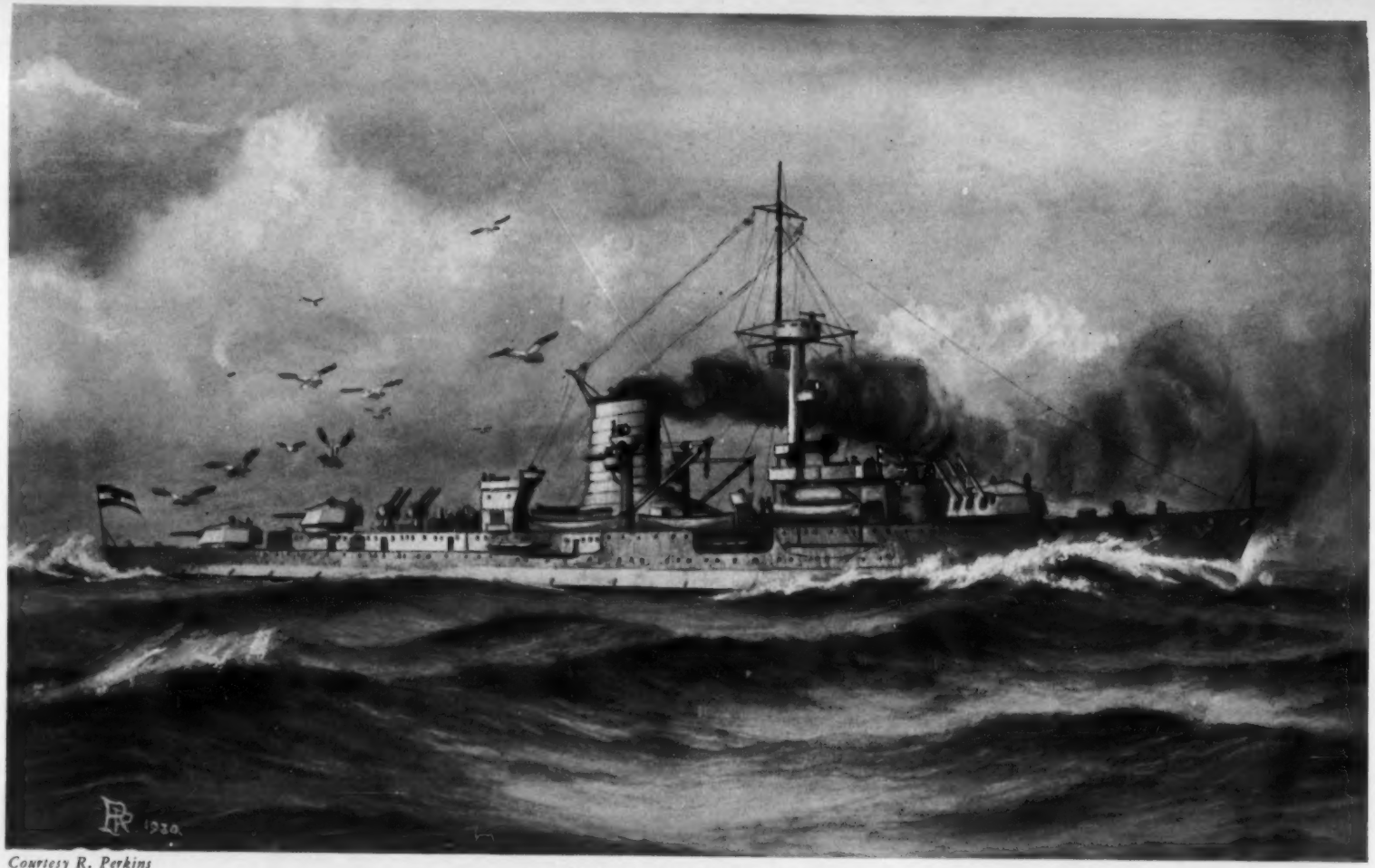
THE NEW GERMAN CRUISER *KÖLN*

This cruiser belongs to the 6,000-ton class and was laid down under the terms of the Versailles Treaty.

THE NEW GERMAN CRUISER KOLN
This cruiser belongs to the 6,000-ton class and was laid down under the terms of the Versailles Treaty.



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THE NEW GERMAN CRUISER *LEIPZIG*
From a black and white drawing based on the latest information from Germany.

P. & A. Photo

LAUNCHING OF THE U.S.S. *V-5*

Mrs. Charles Francis Adams, wife of the Secretary of the Navy, sponsored the giant submersible *V-5* as the craft slid from the stocks into the waters of Portsmouth Harbor, New Hampshire.

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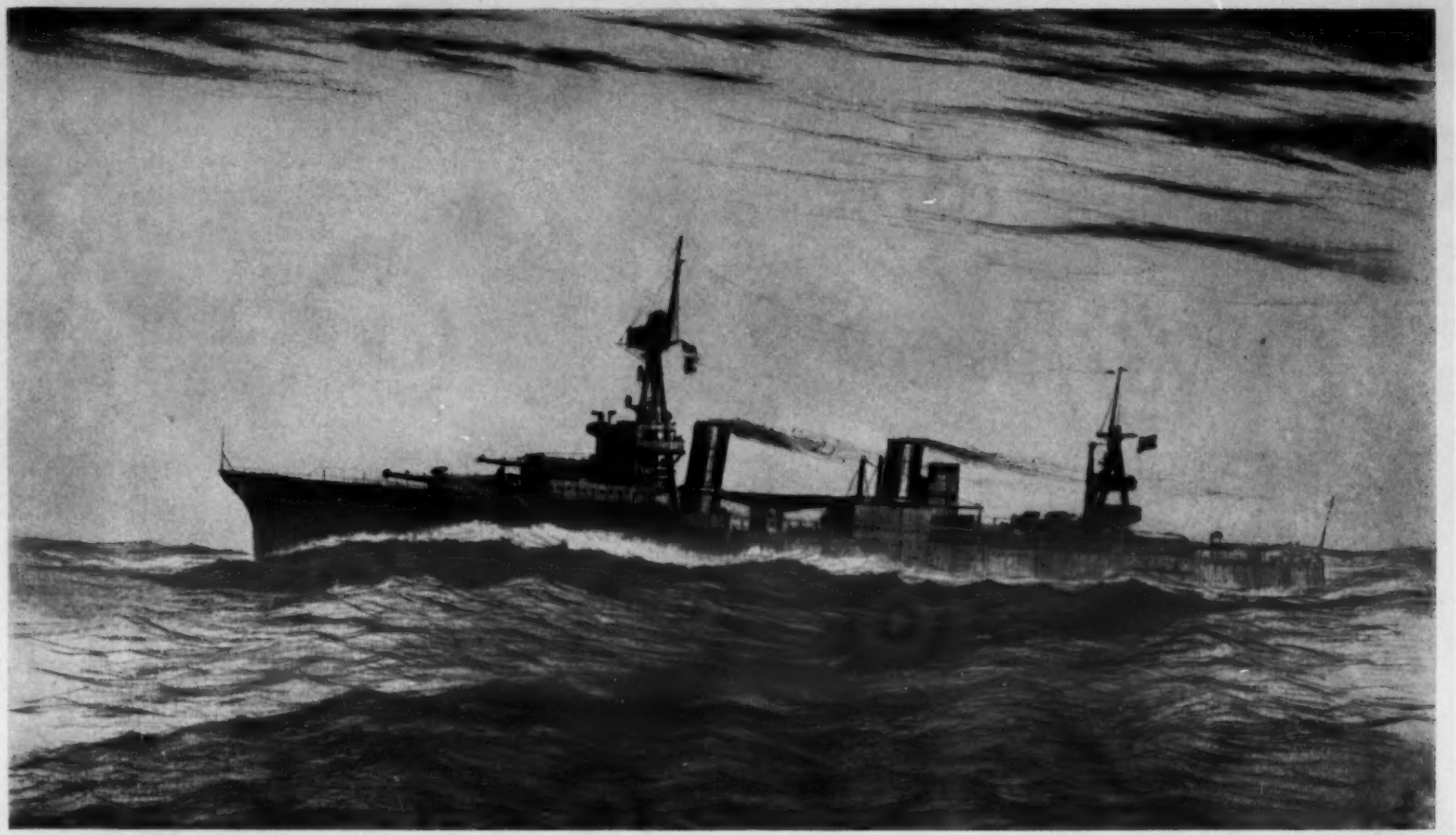

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BY C. J. A. WILSON

A Ten Thousand Tonner — U. S. S. Northampton

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 56, No. 4 APRIL, 1930 *Whole No. 326*

Prize Essay, 1930

Naval Policy *at the* Crossroads

By LIEUTENANT LELAND P. LOVETTE, *U. S. Navy*

The strong arm of the government in enforcing respect for its just rights in international matters is the Navy of the United States.—ROOSEVELT

NAVAL policy in its most comprehensive sense defines the mission of the Navy. It conforms in principle to the means of protecting the existing and traditional American policies. In this study it is my purpose to discuss naval policy as it stands today in official form; and also to touch upon certain international aspects of the position of the United States in the post-war world order in relation to the expressed declaration of the existing policy.

It is the duty of the naval officer to know the policy of his service. In fact, it is to be presumed that naval officers know more about it than any other class or profession. The officer personnel has been singularly free from the influence of party platforms and organized propaganda. Moreover, by virtue of devotion to service and pride in profession, its studies have been directed to the problems of the best defense of the United States with the material and personnel provided.

A marked deviation from the *status quo* will involve reorientation in policy, with attention to the national policies which are inextricably entwined with it. Since law has ever derived its power from force and authority—be it static or dynamic—even so has the last analysis ever proved that policy will depend upon force when a clash of policies arises. It is the way of the world, a law of nature whether it be applied to individuals, parties, states, or nations. Sea power is relative; and therefore an agreement upon armaments is to be desired. Nevertheless, the requirements of sea power to protect American prosperity of the future have not diminished in importance, nor has sea power lost its effect in shaping the destinies of states.

There are facts to meet, and realities to confront. Political slogans and maudlin sentimentalities must be avoided in an effort to reach bed rock. In a study of this description, one must endeavor to avoid the fallacies of imperialistic and militaristic Scylla, as well as the weakening pacifistic and altruistic Charybdis. An accurate middle course must be set. A great and powerful nation will ever require certain instruments to maintain her prestige in world affairs, even though it be moral effect free from any consideration of material gain. One of the most important of these national instruments is a vigorous naval policy acting as a directive for adequate naval defense.

It is the duty of the United States to uphold and cherish every wise and reasoned pact, obligation, and treaty that more effectively tends to the peace of the world. The duty does not terminate at this point; for

A Few Thousand Former U. S. N. P. Northampton

even as a display of force is often necessary in protecting American interests in Nicaragua and Haiti, so it may be necessary to use force in protecting legitimate interests in other international affairs. It is even well to remember that Russia has yet refused to abide by international law as recognized by the civilized powers, and although any conflict of policy is remote, since the United States does not yet recognize her as a state, the truth exists that her expressed basic national doctrines appear to vary considerably from ours. Nations, like individuals, have their ideals and noble principles; but, on the other hand, the eternal realities are ever present. Henry Cabot Lodge said, in the stirring days of the World War:

> If we are to secure our own peace and do our part toward the maintenance of world peace, we must put rhetoric, whether in speech or on paper, aside. We must refuse to be satisfied with illusions. We must refuse to deceive ourselves or others. We must pass by mere words and vague shows, and come clear eyed to the facts and the realities.

Senator Lodge succinctly stated that attitude of mind which should be shown by the naval officer in any study of naval policy and in particular as that policy approaches the crossroads where a change may be for better or for worse.

A thorough understanding of naval policy is a primary requisite to adequate realization of the historical significance of foreign policy. Such studies emphasize the fallacies in the arguments of those individuals who depreciate the value of the military and naval force that made, protected, and defended these United States. Naval policy has in all probability never been studied so zealously as by those officers, high in rank and experience, who have been selected and who are especially fit to advise statesmen as to the mission, needs, and practical operation of the Navy. Moreover, there is that interest among the juniors coming on to take the Navy as it is turned over to them, and to carry on to the best of their ability. It is a great interest, this junior interest, and the naval policy outlined for the future will determine in many minds whether or not the interest of the government is sufficient, and the desires of the people such, that officers of the highest caliber are to be needed. The question is today asked by civilians of high social and business standing, "Is the naval officer's profession what it used to be?" and, "I wonder if my son should enter the service, considering the apathy of many towards national defense." These are momentous questions which only the future can answer correctly.

Foreign Policy

Policy in general may be defined as those precedents, principles, doctrines, and courses of action which determine the conduct of affairs of one nation with another. They are often general rather than definite—abstract rather than concrete. Policy is further subdivided into domestic and foreign policy. We will deal here with foreign policy and its corollary, naval policy. In any study of the foreign policy of a state, naval policy finds expression. The backbone of the foreign policies of all the great powers of the world has been, in the last analysis, naval and military power. This statement is not a vainglorious wave of the flag; it is merely the truth of recorded history, and the majority opinion of those who have given considerable thought to international affairs. Theodore Roosevelt, profound student of history, and naval historian, said in a public address:

> In treating of our foreign policy and of the attitude that this great nation should assume in the world at large, it is absolutely necessary to consider the Army and the Navy; and the Congress, through which the thought of the nation finds its expression, should keep ever vividly in mind the fundamental fact that it is impossible to treat our foreign policy, whether this policy takes shape in the effort to secure justice for others or justice for ourselves, save as conditioned upon the attitude we are willing to take toward our Army, and especially our Navy.

In the next few lines Roosevelt said:

> The strong arm of the government in enforcing respect for its just rights in international matters is the Navy of the United States.

There is organized and highly paid propaganda directed against this "strong arm"; there are lecturers who depreciate the work in the past of this "strong arm"; and it is rumored that there are those in foreign lands who would like to see this "strong arm" materially weakened. What should our naval policy be?

Even a superficial study of the history of most of the great states will show that pure justice and equitable action have not always guided the conduct of their respective policies, whether considered in formulation or execution. The self-interest of

states has been the great factor to reckon with. There is no use fooling ourselves on this score with platitudes and catch phrases. Self-interest and ambition ever dictate to nations, just as they do to individuals and political parties. National prestige will be derived from the justice displayed and the liberality shown in the exercise of strength.

Foreign policy and military-naval policy were closely interrelated in all our great crises. To realize this, study again the negotiations of Benjamin Franklin in Paris, and the effect of sea power on the last months of the American Revolution. Some day Admiral Comte de Grasse will be given his share of credit for the victory of Yorktown. At any rate it terminated the war, and launched us in the family of nations. Then browse just here and there in the diplomatic negotiations of Charles Francis Adams during the Civil War, and see what sea power meant, and how action on his part, according to much opinion, thwarted the intervention of Great Britain. In what measure did the blockade by Northern sea power preserve the Union? Here we find naval policy in all its ramifications, maritime rights of neutrals, right of blockade, doctrine of continuous voyage, and even the Monroe Doctrine, tied so closely to foreign policy, that without sea power little semblance of any enforcement of policies necessary to win the Civil War could have been effected.

The World War presents the classic example of the dependence of foreign policy on the strength of sea power and the use of a fleet. To gain the real significance of this expression of British and American policy, one should read the well-phrased notes of the United States Department of State with our interpretation of the rights of neutrals, the exercise of blockade, and definition of contraband. But no less interest lies in the replies of Great Britain, and certainly far greater interest lies in the action of Great Britain in the interpretation of these disputed and still unsettled questions. We all remember how, when the United States entered the war as an associated power, we properly aided the Allies, and in particular Great Britain, in enforcing the strictest and most drastic blockade ever maintained in sea warfare. Sea power to a great measure decided the World War. It was a strong naval policy from the outset that denied to Germany the "sinews of war."

Naval Policy

At this point one should examine the naval policy of the United States as signed by the Secretary of the Navy, Edwin Denby, on May 16, 1922. That document states:

> U. S. naval policy is the system of principles, and the general terms of their application, governing the development, organization, maintenance, training, and operation of a Navy. It is based on and is designed to support national policies and American interests. It comprehends the questions of number, size, type, and distribution of naval vessels and stations; the character and number of personnel, and the character of peace and war operations.

The essence of our naval policy was expressed in the same document, and was captioned: "The Fundamental Naval Policy of the United States." It then succinctly defines that policy, which in principle is concurred in by every true patriot, by the statement:

> The Navy of the United States should be maintained in sufficient strength to support its policies and its commerce, and to guard its continental and overseas possessions.

The thesis is advanced that the fundamental naval policy of the United States should be preserved in its most comprehensive sense. The facts marshaled hereafter and the observations advanced will be pertinent to this existing policy. Our interest in this question of naval policy and its effect upon foreign policy, and vice versa, is not merely academic. It affects the naval profession throughout. It shapes the size and scope of a navy and determines its mission.

Fallible human opinion will ever disagree over details and matters of degree in the determination of adequate national naval defense. It is only when the United States is hoodwinked, diplomatically speaking, and departs from that parity expressed in her naval policy, "to create, maintain, and operate a navy second to none," that our surest guaranty against war has begun to go by the board. The real security against foreign aggression will be weakened should we sink to the position of a second-class naval power. Yet there are those citizens today who, heedless of chaotic conditions in parts of the world where the United States has an interest, and in face of unsettled and uncodified international law, have allowed the siren song of pure idealism to lead them into a Utopian realm at a time when stern and more practical stuff should be exhibited. I refer to the strong propaganda in some quar-

ters against any defense, and the lack of interest displayed by many in the well-being and efficiency of the Army and Navy, the pay of soldier and sailor, officers and men, and the attempt of individuals and organizations of the *intelligentsia* to detract from the deeds of the military and naval professions in the past. All in all they are tendencies, but should not tendencies be watched?

The functionaries of policy and the functionaries of war should work together. They are citizens of the same free government, and it is their duty to counteract subversive tendencies by educating the people to an understanding of policy in its general aspect, and the just pride that they should have in its bulwark—the Army and Navy. National security and national honor should ever be the goal, but it cannot be assured when naval policy has been forced to a minor and impotent position in the scheme of defense. Such a position might be gained unwittingly.

Strength to Support Policies

The prosperity and prestige of all world powers have been dependent upon the degree of maintenance of their basic foreign policies. It is not beyond the realm of conjecture to visualize what might have happened to the United States and the states of South America had there been no Monroe Doctrine in its original declaration or its subsequent ramifications. It is interesting to note that the matter of self-interest in relation to balance of power caused Great Britain to aid the United States in supporting this doctrine of "America for the Americans" by the threat of British sea power during the doctrine's inception and infancy. The impetus that the Open Door Policy gave to American commerce and foreign markets is an illuminating study. The Navy will always be concerned with the Caribbean Policy and the government's attitude towards insurgents, rebels, and the attendant insurrections in this area. The mere mention of these policies is sufficient to suggest why that important statement, "strength to support its policies," heads the tabulation in the declaration of naval policy.

That baffling and unsolved international problem, the freedom of the seas, remains unanswered. It is in reality only applicable to war. Upon its interpretation to a great degree the strength of sea power and the use of a fleet are based. That is, what policy will dictate the action and use of sea power in its relation to the rights of neutrals, the exercise of blockade, and the form and extent of visit and search? History is our only guide, for nations have come to no agreement in respect to this vexatious question. Kenworthy and George Young in their study, *Freedom of the Seas*, say:

> For whenever the pinch has come British sea power has made short work of rights of neutrals or responsibilities of belligerents.

What these British authors lack in finesse is compensated for by considerable truth. When we ask why the above has been generally true in war, that important word *expediency* holds the essence of the answer.

Monroe Doctrine

The Monroe Doctrine was framed and maintained as a necessary policy to safeguard the perpetuation of the Federal Union. It was clearly foreseen that should the European systems be extended to the New World and thereby draw the new states into the Old World brawls and wars, it would have a deleterious effect upon the functioning of our government. In other words, it was a recognition on our part of a preference for democratic government over that ruled by monarchy and absolutism. It was a desire also on our part to help the self-governing and democratic states of South America; it was a policy of self-defense founded on geographical-political principles. It was hoped to produce a barrier against the colonization and imperialism of Europe. History has proved the soundness of the original intent.

The strength and enforcement of this doctrine depended for a time upon the sea power of Great Britain. Channing supported any policy that would thwart the extension and colonial accessions of Continental Europe. The United States was most fortunate as a nation in receiving this powerful support. The Monroe Doctrine was recognized in Sir Austin Chamberlain's official letter of May 19, 1928, to the American Ambassador Houghton pertaining to the British official interpretation of the Kellogg Pact before committing Great Britain to its stipulations. In paragraph 10 of the above letter, we read:

> The language of Article I, as to the renunciation of war as an instrument of national policy

renders it desirable that I should remind Your Excellency that there are certain regions of the world the welfare and integrity of which constitute a special and vital interest for our peace and safety. His Majesty's Government has been at pains to make it clear in the past that interference with these regions cannot be suffered. Their protection against attack is to the British Empire a measure of self-defense. It must be clearly understood that His Majesty's Government in Great Britain accept the new treaty upon the distinct understanding that it does not prejudice their freedom of action in this respect. The Government of the United States have comparable interests any disregard of which by a foreign power they have declared that they would regard as an unfriendly act. His Majesty's Government believe, therefore, that in defining their position they are expressing the meaning and intention of the United States Government.

There have been many interpretations of the Monroe Doctrine by governments and by students of international affairs. There is considerable literature to be read on the subject. Scholars have been at variance as to its benefits and its application. However, what concerns us in this study is that it has been a policy; it has with but few exceptions been maintained; it would probably be evoked immediately should conditions demand it; and it has depended upon a "fleet in being" for its greatest support, first by that of Great Britain, and then by that of this country. Theodore Roosevelt said in substance that the Monroe Doctrine was just as strong as the American Navy. That great President, in an official speech and message to the people said:

The Monroe Doctrine should be treated as the cardinal feature of American foreign policy; but it would be worse than idle to assert it unless we intended to back it up, and it can be backed up only by a thoroughly good Navy. A good Navy is not a provocative of war. It is the surest guaranty of peace.

It is peace in the Western Hemisphere that is to be desired and worked for. The Monroe Doctrine more than any other policy has contributed its share to the peaceful evolution of democracy in the New World. President Hoover in his Good Will Mission clearly expressed our government's desire to maintain the traditional friendship with its southern neighbors, and in definite terms conveyed our pleasure in their commercial gains and prosperity.

The "open door" of commercial opportunity and equal trade applied incalculable impetus to the foreign trade of the United States. This policy was promulgated in principle by our government in the early days when our sea power was weak and our population small. It was based upon equitable and just premises. In other words, our desire was for trade in the great marts of the world. The fathers of our government soon advanced the doctrine that trade on the seas of the world should not be a monopoly of any power or powers. In later years, when the all-embracing imperialistic policies of great powers were in the process of execution, looking after backward peoples and carrying the "white man's burden," the United States with foresight and astuteness secured adherence by the great powers to what is generally known as the "Open Door Policy" of John Hay. This policy particularly applied to the Orient, and expressed the desire that equal opportunity should be given to all nations in trade, and by expressed terms suggested that an agreement should be reached that would militate against further partition of weaker states. Sun Yat Sen once told the writer, "This policy more than any other prevented the dismemberment of China." There are Asiatic problems today closely related to it, for it is also pertinent in its application to "spheres of influence." Manchuria is yet a problem in the maelstrom of Asiatic politics.

The support of a doctrine of equal opportunity is a fundamental requisite to the success of our ocean-borne commerce. A great share of the prosperity of the United States is derived from foreign trade, with the protection of the long sea lanes and lines of communication falling to the Navy. It is here that naval policy is closely related to that phase of foreign policy concerned with trade.

More and more will the United States look to foreign ports for raw materials as she grows industrially. Her economic life will to a great measure depend upon markets for the manufactured goods, and the ability to purchase raw materials. Difficulties will arise, as they have always arisen, over foreign trade. Such conflicts have been the source of practically all international friction on a large scale. The "battle for oil" is a stupendous struggle today. The United States is consolidating her position in foreign markets with speed, and more than ever before needs corresponding insurance from sea power. It is doubtful whether the

United States will ever again allow a belligerent to make all the rules of contraband and seriously interfere with our neutral trade. Who can venture to assert that sea power will not have a great rôle?

The rights of neutrals in war, the concrete definition of blockade, and the specific classification of contraband, are questions which at the present time are undecided by any international agreement. They are grave questions and in some respects more important than the questions now discussed in international conferences, for in the interpretations given to them and in their applications lie the seeds of war. History clearly records that in emergencies great sea powers have dictated their own definitions whenever and wherever possible in order to enforce their policies. Expediency ever acts in emergency. Their war policies may not be pursued when war is over, but it is a different story when a country's back is to the wall.

There is no generally accepted definition of freedom of the seas. Whatever may be the interpretation today as enunciated by the expression of opinion from militarists to pacifists inclusive, there remains the historical method for those in search of data—the facts of yesteryears. There is much hope for a new world order, and great minds and high personages are striving for surer guaranties of world peace; but the policy of how a navy is to be used in respect to its contact with neutral trade is the focal point of much relevant matter upon which nations do not care to commit themselves in time of peace. It is to be hoped that some day this question will be fairly answered in international conference. Any comprehensive study of all that has been said and written on the freedom of the seas will convince the student that just how and to whom the seas will be free in war is unanswered; but it stands to reason that small powers will never decide for the large ones in the matter of how and where they will carry commerce, that is, unless a strong enough coalition can be effected. A strong commercial power with a weak sea power may face this reality.

When the United States has been at war she has never stood for the complete freedom of the seas as defined by her at times when she was neutral. We recognized the effectiveness of sea power in the last war, after we entered it, by assisting in as strict a blockade as it was possible to enforce. Observe the Civil War and the curtailment of provisions and supplies that finally bore fruit in bringing Lee's half-starved army to terms. The blockade of Cuba was one of the first operations of the Spanish-American War. We remember the most drastic, effective blockade ever maintained with a great fleet, that of the British Navy in the World War. This blockade was later augmented by a squadron of American battleships.

In the last analysis, freedom of the seas in war is gained by command of the seas, if I may take liberty with the broad term. This will be gained by a dominant naval force. The naval policy in its treatment of belligerents and neutrals will be evolved from the inalienable rights of self-defense—the most expedient methods to terminate the dispute, adhering wherever possible to the generally accepted principles of international law. For a neutral, sea power is required. The exchange of diplomatic notes and protestations will be of little avail, if the examples of fourteen and fifteen years ago have any validity.

Richard Washburn Child recently wrote:

> Because freedom of the seas in some formula of guaranty for the continuity of our foreign trade is one of the reasons for naval rivalry, any negotiations which attempt to crystallize agreements as to ratio of index comparisons between our Navy and that of Great Britain which does not include a settlement of the freedom of the seas doctrine from the American point of view is downright improvidence.

It is well here to inquire, what is the traditional policy of the United States with respect to the rights of neutrals in maritime war? The little green book entitled *Instructions for the Navy of the United States Governing Maritime Warfare, June, 1917*, has been withdrawn. It was the last official word on the subject and was clearly our one-time official policy based upon legal interpretation of generally accepted international law. It was prefaced as follows:

> The following instructions have been prepared in accordance with international law, treaties, and conventions to which the United States is a party, the statutes of the United States, and, where no international agreement or treaty provision exists covering any special point, in accordance with the practice and attitude of the United States as hitherto determined by court decisions and executive pronouncements.

It would be presumptuous for any student of international law and foreign policy

to venture the prediction that the above quotation would or would not preface such instructions if reissued in the future. They will probably never be issued in like form again. But if they were issued, and the United States were a neutral, what guaranty has this country that the liberal attitude of the United States towards neutral trade would be enforced. It must never be forgotten that a belligerent sea power if of sufficient force, will at the first opportunity drive the enemy from the seas, and then cut off her neutral commerce. Even should the United States never engage in another war, what assurance have we that our great commerce can flow without sea power to protect it? Or as regards President Hoover's desire that food stuffs for civilians be allowed ingress to both belligerents, what will cause such an innovation to become an accomplished fact? One is strongly inclined to believe that sea power will do it.

The tremendous increase in the ocean-borne commerce of the United States is recognized by all. Is it not true that this country should be even more solicitous of the rights of neutrals in maritime war? Should naval policy ever neglect this paramount interest? The ever-expanding world commerce of this country requires adequate protection, whether we are neutral or belligerent. American maritime interests and the increase expected will require cruiser tonnage "second to none" to meet the demands which may be made for merchant-ship protection.

Our friend and greatest commercial rival, Great Britain, fully comprehends that in her foreign commerce lies her greatest revenue, her sinews of peace and war, her jugular vein of prosperity. Hector C. Bywater in *Navies and Nations* quoted Mr. Winston Churchill as saying, soon after the Armistice:

> Nothing in the world, nothing that you may think of, or dream of, or anyone may tell you; no arguments, however specious, no appeals however seductive must lead you to abandon that naval supremacy upon which the life of our country depends.

British sea power saw that British economic life was maintained by ultimate victory over her great rivals at successive periods in history—Spain, Holland, France, and finally Germany.

Fundamental foreign policies will be maintained if national interests demand it, and the Congress is fully cognizant of the national position. Great economic expansion requires foreign policy and the services of government to protect and safeguard its interests. Should diplomacy become bankrupt and peaceful negotiations fail, then national honor and national interests require some force, some power to gain recognition of vital and just interests. It must be a tangible, existent force comparable in its preparedness to the force behind all law of the land.

Strength to Support Its Commerce

History has no parallel for the meteoric rise of the United States in commerce and trade for the fifteen years beginning in 1914. There are numerous contributory causes that effected this fact. In the main, they were world conditions and economic factors that sprang from the World War. The existing naval policy states that the Navy should be of "strength to support its commerce." How few give thought to this need. How many, lost in the dreams of what we all should like to see, preach little or no protection for this ever-increasing commerce. The size of a navy must be studied in terms of trade routes in both oceans and the nature of the protection required. Naval policy will here focus attention on cruisers and the matter of ridding the seas of enemy raiders. The number of cruisers should logically be determined by the number of merchant ships carrying American goods. In this respect naval policy should be particularly definite.

The United States, holding a major share of the world's credit and an ever-increasing share of world trade, should never lose sight of the danger of economic rivalry. It seems sensible to believe that just as long as kings, potentates, and heads of states require police protection, just as long as armored cars are needed to transport bullion or securities, just so long as insurrections and rebellions occur in great and small states, just so long will a rich ocean-borne trade depend in emergencies for its existence and well-being upon its sea power.

In a comparison of the old-fashioned ideas of conquest and dominion with the modern commercial era, Richard Washburn Child writes:

> The truth of the matter lies deeper. Navies in these days are maintained for defense of a nation under any circumstances and for protection of one's own commerce or a threat for another's

commerce. It is plain enough to the clear thinker that rivalry in naval prestige rests upon questions of trade, commerce, and economic rivalry.

The United States holds the strongest financial position in the world. In our settlements with the fifteen debtor nations this country will receive $22,206,275,638 over a sixty-two-year period, from the war loans of $9,862,316,802. The principal and interest paid each year amounts to about $200,000,000. The Department of Commerce estimates that the value of stocks and bonds sold to foreigners in 1928 was more than $1,500,000,000, of which it was estimated that the people of this country bought back $1,000,000,000. We are citizens of a creditor nation which holds $14,000,000,000 of long-term foreign investments, exclusive of war debts. The United States exported more than $500,000,000 of gold last year, while the yearly interest on long-term foreign investments amounted to more than $800,000,000. These staggering figures are given to point out the fabulous wealth of the country. The figures a decade hence are beyond prediction. There is a question which might present itself to those who give thought to the subject: will there be sufficient insurance on these great sums to prevent repudiation or a failure to comply with the provisions of agreements? Naval policy should ever provide the bulwark for the protection of a great state's wealth.

The import and export trade of a country is invariably a barometer of prosperity. In 1928 the exports of the United States totaled $5,128,000,000 and the imports (largely raw materials) reached $4,091,000,000. An official estimate has been made that the foreign trade was in reality over $22,000,000,000. This is due to the non-goods values that passed over and out of the United States.

Government support in some cases, and certainly years of labor, have been required to build up this vast trade. Strong opposition to American economic penetration exists in sections of the world. The above-quoted figures give some conception of the tremendous amount of commerce involved. There is the inevitable conflict that arises over a gain in the sale of the products of one country and the diminishing sales of another. As an example, there is at the present time a decided opposition abroad to American motion pictures. Isaac F. Marcosson, one of our keenest observers of foreign affairs, writes:

> Whereas we possess only 6 per cent of the world's land, comprise 7 per cent of the total population, grow 27 per cent of all the wheat, dig 40 per cent of all the coal, use 63 per cent of the telephones and make more than 85 per cent of the motor cars, we produce nearly 90 per cent of all the films. Knowing this you can readily understand why the American picture has drawn the lightning and why every effort is being made to stop its advance.

The renascence of American shipping interests is a factor of national prosperity tied to foreign trade and supported by foreign policy. As stated before, the mercantile marine requires protection. Captain Dudley W. Knox, commenting on this phase of our wealth and on our need of cruisers, wrote in an article for the New York *Times*, that which cannot be denied:

> The stoppage of our sea-borne commerce would cause the shutting down or drastic reduction in operations of nearly every factory and industrial enterprise in the United States. Millions of people would be thrown out of work and remain with no means of support until the sea lanes were again open. In the World War the Allied cruisers, backed by their fleets, not only made it possible to supply the armies and thus to carry on the war, but also stood between civil industrial life and the poverty stricken condition to which Germany was reduced in consequence of the blockade.

A comprehension of the size of foreign trade is essential to an understanding of the importance of sea communications and the necessity for its protection in any emergency. It has been officially computed that our annual foreign water-borne commerce totals about 100,000,000 long tons, valued at a figure estimated to be over $8,000,000,000, with a freight bill of $750,000,000. Last year American ships carried only about one third of the above commerce. Less than 9 per cent of the value of American commerce for the period 1910-14 was carried in American bottoms. The trade increase over the pre-war period accounts for much of the prosperity of this country. This increase since the war has been 200 per cent with South America, 380 per cent with Asia and about 325 per cent with Africa. Since Mr. Hoover said recently, in substance, that one home in ten is dependent upon the export trade, I take the liberty of elaborating that remark and venturing the thought that in an emergency one home in ten will be dependent upon the protection of that trade. Will American shipping ever be embarrassed and

interrupted as it was in 1914, 1915, and 1916? Naval policy should be strictly mindful of foreign trade, the sea lanes of the world, and the size of the mercantile marine.

There is ever the question of new and more fruitful markets. "Manifest destiny" with its burning desire for territory, which conquered by war and by purchase the present boundaries of the United States, no longer obtains. This territorial expansion is not a satisfactory analogy, but it furnishes a historic parallel, in a measure, to the causes which push a manufacturing nation into new markets wherever they can be secured. The exportable surplus of a country, coupled with a desire to purchase raw materials, supplies the main spring for this need. Where will the search for the dollar end? It is a laudable pursuit when honest weight and true values are given, for we are supplying the world with much which they need in this mechanized, industrial age.

The *London Times Trade and Engineering Supplement*, commenting on the proposed United States of Europe, says:

> European nations attempting to act as separate entities are powerless to resist the American invasion and their bid to present a united front in commercial matters is a reasonable reaction to the aggressive economic policy of the United States.

It is a historical paradox that "peaceful penetration" has often led to war. The great hope of the United States is that this will never come to pass in our case. The fight for new markets and for the retention of trade already secured caused wars by which the Egyptians, Phoenicians, Greeks, Romans, and Venetians each in turn had dominance, and then passed the scepter of the seas on to the next. It was not passed without a struggle. Then came the maritime heyday of Spain, France, and Holland, each of whom succumbed to the "wooden walls" of England. We all know of Germany's bid for world trade and of her efficient, vigorous fight for foreign markets prior to the war. It is repeated: war is not wanted, but, in view of the treasure involved, what better protection exists than adequate defense? Treaties cannot be depended upon in all cases to enforce American policy and to secure her just claims, particularly when a violation of contract or an infringement of our rights jeopardize American prosperity.

To Guard Its Continental and Overseas Possessions

This last, but probably most important, clause of the fundamental policy of the United States embraces as its mission the first-line defense of the United States and her possessions. It can mean nothing but adequate defense and well-trained defense. Under the caption "General Naval Policy," one finds certain specific missions which lead to the practical fulfillment of the letter of the fundamental policy. They are stated in the following terms:

> (a) To create, maintain, and operate a navy second to none, and in conformity with the ratios for capital ships established by the treaty for limitation of naval armaments.
>
> (b) To make war efficiency the object of all training, and to maintain that efficiency during the entire period of peace.
>
> (c) To develop and to organize the navy for operation in any part of either ocean.
>
> (d) To make strength of the navy for battle of primary importance.
>
> (e) To make strength of the navy for exercising ocean-wide economic pressure next in importance.
>
> (f) To cultivate friendly and sympathetic relations with the whole world by foreign cruises.

The extent of the Atlantic and Pacific coast lines of the United States presents a difficult defense problem. They together comprise the longest sea-girted national boundary in the world. Their defense is in many respects a greater problem than Britain's problem of protecting her sea lanes. The Navy has been entrusted with the continental protection by policy, and will discharge its duties in an emergency with the force furnished. It cannot be improvised and will require a fleet in being. A serious reduction in the present naval force will certainly require a restatement of naval policy. The Navy has never been accused of failing to make the best disposition of the force furnished. The question for the verdict of the people is, will the insurance be adequate to the national possessions at stake?

In any consideration of the defense of continental shores and overseas possessions, the problem resolves itself in general into the ability to operate immediately and with maximum possible efficiency in either ocean or in both. It follows that this involves distribution of forces and the effecting of concentration. These problems are intricate and require the highest degree of knowledge, coordination, and technical skill on the part of

the high command. The naval policy of the United States will determine in general the plan for their execution in any emergency, and great caution should be exercised when the diplomatic rapprochements and plans of foreign powers indicate a tendency on their part to effect a treaty with us which would diminish the normal distribution of our sea power in any strategical area necessary for our protection.

Many writers have considered the Battle of Manila Bay to mark the entrance of the United States into the class of world powers. In other words, with little effort the United States became a colonial power and by possession of the Philippines entered as an interested party into Asiatic politics. It is beyond the scope of this article to remark upon the significance of these islands other than to mention their strategical importance and their proximity to the Asiatic mainland. At the present time the Pacific basin occupies much thought from an economic and political viewpoint. The unsettled political condition of China, the ambition of Japan, and the practices and political creed of the Russian Bear constitute a world problem, to which those who direct the foreign policies of great commercial states are giving serious and profound thought. There is every reason to believe that the Singapore Naval Base will be completed—a crowning of the many naval bases Britain holds the world over. Although the United States has by treaty promised to add nothing to the defense of the Philippines, this policy should not interfere with the defense required to protect the vital sea lanes of the Orient, which involves a question of importance to the commercial interests of the United States. It seems illogical and untenable to hold that the United States requires no protection or scarcely any in the face of the Singapore Naval Base and the strong defense of the outlying islands of Japan. The Philippines comprise a strategical area in which the United States by geographical position has much interest, and any departure from the adequate protection of such areas will considerably jeopardize the outcome of many situations in which the United States might be placed by force of circumstances, situations nevertheless vital to her interests.

In the desire of the United States to forestall attempts by foreign powers to secure a footing by seizures of custom houses, etc., in the Caribbean area, certain principles of policy have been followed, referred to by writers as the Caribbean Policy. This policy is predicated upon a protection of American interests and is even liberally interpreted to mean aid for local governments in that area when threatened by insurrections or revolution. One infers from the past application of this policy that the United States desires no interference from foreign powers even though the interference be a collection of their debts or just obligations. The United States has by its good offices effected arrangements whereby collection may be made and paid to the creditor nations, and by such action prevented a lien or "strangle hold" by the foreign powers on the territories and possessions of the smaller states in question. There is much criticism from some quarters on the application of these principles, but vigorous and timely action on our part has prevented intervention and even occupation by other powers. Furthermore, such action on our part has decided whether or not the United States would be reckoned as a second-class power in respect to this phase of international relations. Any perusal of the high lights of this chapter of diplomacy will show at first glance that a good, efficient navy has much to do with the enforcement and continuation of this policy.

The protection of the Panama Canal is vital to the well-being of the United States, whether a belligerent or a neutral. It is the link that must be controlled in any war. It is the main factor in any strategical and in many cases tactical study of the employment of our fleet. It took many years for the United States to secure the territory, the rights, and the canceling of a treaty with Great Britain. A reduction of the existing force will not ensure its protection. After the years to effect the conditions by which the canal could be built, and the great engineering and even medical skill in accomplishing this task, one should not speak lightly of its protection, or cease to voice an opinion as to the adequate defense needed. Is not the strategic line of communications between the Atlantic and Pacific Oceans a priceless legacy brought into being under the leadership of Roosevelt, Goethals, and Gorgas? It is for posterity to defend and strengthen it rather than weaken its security.

The need of cruisers and the size of cruisers enter into any discussion of the protec-

tion of foreign possessions of the United States, when that question is considered in terms of trade. It is natural and reasonable that Britain should take other views in the light of her many naval bases and suitable naval auxiliaries. The small cruiser is adapted to her needs, and Great Britain has usually perceived her needs. Great Britain has 880,000 tons of relatively fast merchant ships in comparison to 188,000 tons of such ships of the United States. A considerable number of these ships are capable of conversion to auxiliary cruisers. The scarcity of these auxiliaries and the few United States bases with long lines of communications make the 8-inch 10,000-ton vessels desirable, in fact necessary, for the United States to maintain parity in any comparison with the respective missions of the two countries.

Battleships will remain the backbone of the fleet. They are not to be considered in their mission, whether as an offensive or defensive instrument, in the category of cruisers, or such weapons of opportunity as the submarine. They cannot by their nature be used as commerce raiders or as efficient escort to commerce. They are constructed to take knocks and to receive them in fleet action, in particular, and in land bombardments, with limitations. The Associated Press reports on December 21, 1929:

> Secretary Stimson said today that he is one of those who believes that capital ships are still the core of a fighting sea fleet, but that the United States will approve a reduction in capital ships in the event this is agreeable to the other sea powers, Great Britain, Japan, France, and Italy.

It is believed that whatever the outcome of the London Conference, a reorientation of United States naval policy will be required. Any limitation that provides adequate defense and removes excessive taxation is to be desired. The great causes of war lie beyond limitation of armaments, and the hair-splitting of tonnage details. The roots of war lie in the probable clash of commercial interests, the utter disregard for a nation's foreign policy, and the rights of belligerents and neutrals in maritime war. The United States, with some deviation, has, since the War of 1812, been the defender of neutral rights in war, and Great Britain in the majority of cases has been the defender of belligerent rights. An agreement of understanding on these vexatious questions should provide a point of origin for most constructive work in the realm of international good will. Nations display a marked aversion for free discussion of what their attitude would be toward neutrals in a war in which they might be belligerents.

It is through commercial prosperity that we grow as a nation. It would be foolish to advance the prophecy that a clash of interests is not a possibility. It is to be hoped that a settlement may be effected by peaceful means. Vice Admiral Meurer of the German Navy recently wrote:

> It lies in the very nature of great powers and progressive peoples to expand at the expense of others. Nothing will ever be able to change this fundamental principle no matter how much one may talk of eternal peace at congresses, conferences, or leagues of nations.

The keynote of American foreign policy has been friendliness and desire for peace. When one asks what agency would protect and defend her legitimate foreign interests should peaceful means be of no avail, there can be but one answer, and that is—sea power. Some say that sea power is unnecessary, and that the Kellogg Pact, the League of Nations, and the World Court will attend to all disputes. It is hoped that they will, and thereby in many cases they will serve mankind to good purpose, but by what power will their decisions and verdicts be enforced should moral suasion fail? Washington once wrote to Knox, "It is among the evils, and perhaps not the smallest, of democratic governments, that the people must always feel before they will see." It is at that stage of affairs where public opinion feels that cherished interests have been violated and national honor is at stake, that the opinion of any organization or league dominatingly foreign should be as chaff in the wind.

The thesis is presented that upon our naval policy will depend our peace and security. It is believed that the Navy, as a whole, voices the sentiments of Theodore Roosevelt when he said:

> The United States Navy is the surest guarantor of peace which this country possesses. Our voice is now potent for peace, and is so potent that we are not afraid of war. But our protestations would neither deserve nor receive the slightest attention if we were impotent to make them good.

It is paradoxical but nevertheless true that authority and force are required to insure peace in civil, national, and international affairs. There are prominent pacifists who

advocate the cultivation of the international mind. This is to be commended within reason, but not to the degree that we are maneuvered into a position whereby other countries may pass official judgment upon the legality of our affairs. A favorite expression of Dr. James Brown Scott, one time counselor of the State Department and recognized authority on international law, is that we found very early in our diplomatic dealings that it was preferable to look after our own affairs rather than entrust their execution to others.

There appears to be no panacea for the ills of the world. The best minds should ever advance constructive measures that will tend to relieve mankind from the burden of capitalistic exploitation, economic slavery, excessive taxation, and war. Checks and safeguards have been devised which will tend to prevent such a catastrophe as that in 1914. Arbitration, conciliation, and mediation will also perform their share of good work. The United States has always stood for these peaceful methods of settlement, and some of the outstanding principles of their operation were originally advanced to the world by the United States. The problem of world peace will not be solved by either the pacifist or militarist. The thought of war and adequate defense against war are anathema to the pacifist, while, on the other hand, the militarist stresses too strongly the theory that "might makes right." The safe road lies between the two extremes, and it would be decidedly impolitic for those shaping policy to embrace either of the radical opinions. The problem of adequate defense and all its corollaries comprise a study of vast proportions. Superficial knowledge and misguided altruism prompt many of the statements of the day. There are grains of wisdom in the generality that statesmen build and plan for posterity, while the politician builds and plans for the next election.

Foreign policy and naval policy are interrelated in the same manner as law and its enforcement. Their strength will depend upon the interests and will of the people. The Navy deserves the support of the people through their elected representatives, for the service has yet to fail the country in need, and has maintained a commendable efficiency in the face of apathy, organized propaganda, and from some quarters an absolute lack of appreciation of its needs. Naval policy will support foreign policy in proportion to the strength of the Navy. Those who are awakened to the influence of foreign policy and its importance in the affairs of the world will become aware of the need of its "right arm." In other words, thoughtful people will be impressed with the necessity of maintaining a navy adequate to its responsibilities. Chief Justice Taft, when President, stated, "The world's history has shown the importance of sea power both for adequate defense and for the support of important and definite policies." Woodrow Wilson said: "Our ships are our natural bulwarks." There are without question "important and definite policies" to maintain and naval policy should be forged to meet all demands and respond to all orders with celerity, maintaining a preparedness proportionate to the greatness and wealth of the nation.

The goal of humanity which lies on the horizon is the common brotherhood of man. It seems that its attainments will be best realized through the development of free and self-contained nationalities, each aiming at coöperation permeated by a spirit of friendliness, but "each sufficient unto itself, as a free man is sufficient unto himself." The goal will be gained neither by aggressive foreign policies with tremendous armaments nor the reduction of adequate defense to enforce the existing policies. It will be a fleet "second to none," with the profession of faith that its mission lies in the display of justice as well to the weak as the strong.

The memory of man is short. It is in the nature of things that prosperity and luxury dull the senses to remembrance of the lean years. Sea power has been a writer of history and a predominant factor in the rise of the United States as a world power. It would be a sacrilege to weaken the bulwarks of her safety or abandon measures that should be able to determine her future.

Lost, Strayed, *or* Stolen—Four Gunboats

By LIEUTENANT COMMANDER GLENN HOWELL, *U. S. Navy*

HARBIN is situated upon a tributary of the Amur River. A look at the map will reveal the fact that the Amur flows in a general northeasterly direction from this corner of China up through eastern Siberia and debouches into the sea about a thousand miles north of Vladivostok opposite northern Sakhalin. The port at the mouth of this great river is Nikolaevsk.

During the early summer of 1919 river pirates became active in the vicinity of Harbin, and as their numbers increased the local officials of the province presently found themselves powerless against these miscreants. They had no facilities for combating the pirates, and hence in the middle of the summer they appealed to the Central Government for aid. So Peking ordered four gunboats regularly stationed on the Yangtze to proceed to Harbin via Nikolaevsk.

The gunboats, in none too good condition either in material or personnel, sailed hurriedly from the Yangtze shortly after receiving emergency orders from the Central Government. They had little more than enough supplies to make the trip. However, before they sailed they arranged to have extensive provisions, supplies, and winter clothing shipped by Peking to Habarovsk, a Siberian city on the Amur on the Manchurian border line. It was reasoned both by the commander of the little force and the minister of marine that the ships would reach this border city before the winter set in.

The gunboats sailed from the Yangtze for Vladivostok in the middle of the summer. They arrived at the Siberian port after a slow voyage. They fueled there, took on provisions for the voyage north, and then were delayed for a month waiting for permission from the Russian authorities to pass through Siberian territory en route to Harbin. They eventually received this permission from the Vladivostok officials and sailed for Nikolaevsk.

The summer drew to its close. Peking became worried about the nonarrival of these gunboats on the Siberian-Manchurian border. Futile efforts were made to find out whether they had ever arrived at Nikolaevsk. But by this time the waves of the Red Revolution of Russia were inundating Siberia in increasing volume. The great northland was in a confusion impossible to describe: one city in the grip of the most violent Red elements; the next town still clinging to the old ideas; a third viewing the Great Experiment with doubtful eyes, fearful of change, dissatisfied with the past; the White element slowly changing to Pink, and through Pink slowly to the savage Red climax of the Revolution. The aristocrats, the formerly prosperous upper middle class, and the professional groups were fleeing for their lives out of the terror and the confusion, fleeing in disguise, meeting agonizing poverty, tears, and bloodshed; a people gone mad; the overthrow of a race.

The summer passed and autumn came on. Peking became more and more concerned about the gunboats. Then winter came and passed, and the government finally decided that the little fleet must have been lost at sea in the voyage from Vladivostok to the mouth of the Amur.

Strange rumors drifted into the outer world in the spring of 1920, rumors of extraordinary happenings in the north. There originated a brief but apparently authentic report in Japan that the Japanese garrison at Nikolaevsk had been massacred by Siberians and Chinese. Then came a statement from Tokyo that on June 2 a relieving force of Japanese had reached and occupied Nikolaevsk. There was no way of verifying this report, for the confusion in Siberia was increasing rather than clearing and shipping to the northward of Vladivostok was paralyzed.

There was still no news of the missing gunboats, and Peking had given up hope of ever hearing of them again. They had then

been gone from the ken of the world for some nine or ten months. However, they were neither at the bottom of the sea nor sunk in the Amur. And in the end they returned to the world and resumed their places as units of the Chinese Navy.

As has been stated, the gunboats were delayed a month at Vladivostok waiting for permission from the Russian government to pass through Siberian territory en route to Harbin. Thus it was that when they finally reached Nikolaevsk it was already mid-October and it was apparent that they must hurry if they were to avoid being frozen in the Amur for the winter. So they delayed at Nikolaevsk only to take on board some fresh provisions.

They made good time up the Amur and were presently nearing the border of their own country. The officers were congratulating themselves on their narrow escape from a winter in ice-locked Siberia and were looking forward to obtaining their supplies and winter clothing and equipment in Habarovsk. And then, only eight miles from their goal, only eight miles from the Chinese border, came serious interruption.

Without warning, heavy guns mounted on both banks of the river opened fire on the ships. Utterly unprepared for such a contingency and without understanding the identity of their mysterious enemies, the gunboats without firing a shot dropped down the river out of range of the batteries. Here they anchored.

Envoys presently arrived, and parleys began. It developed that one General Kalmikoff was their assailant. This radical official had brought these heavy guns down to dispute the passage of the Chinese. He informed the commander of the little force that he did not recognize the authority of the Vladivostok government, that permission for the Chinese to pass through his territory would not be granted, and that under no circumstances would he allow the gunboats to pass through to Habarovsk and Harbin.

In vain did the Chinese plead that they might be allowed to send the short distance to Habarovsk for their supplies and winter clothing. Kalmikoff flatly refused them any concessions to his dictum. Realizing the hopelessness of attempting a settlement with the general, and bowing to his greater force, the Chinese announced their willingness to return to Nikolaevsk until they could apprise Peking of this fresh interruption to their progress. Again they attempted to persuade the Red general to allow them to send to Habarovsk for their supplies and clothing, but Kalmikoff turned a deaf ear to them. In the end the gunboats were forced to return to Nikolaevsk without their supplies and without winter clothing of any kind. The commander of the force delayed as long as he dared risk being frozen in with the vain hope that he could persuade the Red general to revise his position, but in the end the gunboats were forced to retreat hurriedly to Nikolaevsk.

The ships reached this city at the mouth of the Amur on November 3. They had arrived just in time, for already an inch of ice covered the river. It was of course obvious that this port must be their winter quarters, for though they had sent via Kalmikoff a message to Peking containing the details of their predicament, a message that needless to state never reached its destination, they knew that even if a reply were immediately received it would be too late for them to move. They therefore made hurried preparations for the winter.

Permanent anchorages were selected. Solid wooden structures were built up from the main decks flush with the ships' sides as far as the superstructures and were then roofed over to keep out the bitter cold of the six months' winter then upon the fleet. All rapid-fire guns mounted on the superstructures were dismantled and stowed below to preserve them from the weather and to make more room inside the small living space. Every spare foot of room inside the shelter was filled with firewood. The only opening in each wooden housing was a door cut through at the head of the ship's accommodation ladder. Thus it was that winter came upon the little fleet. Minus proper clothing, officers and sailors were compelled to remain huddled in their refuges stoically awaiting the return of spring and their release. At that time the Japanese garrison of the place at least regarded them with indifference, and the townspeople, still White before the advancing tide of the Revolution, treated them with as much kindness and sympathy as is ever displayed in the Orient. Then there were some four thousand Chinese living in the city, drifted up from the south in the way that Chinese have of

seeping into strange, out-of-the-way places of the earth. These nationals did what they could for their wretched, seafaring protectors.

Slowly, relentlessly, the advance of the Reds across Siberia continued. There was no stemming their approach. It was like a stain of blood from a bleeding body, spreading, permeating everything, always slowly creeping. The remaining Whites, panic in their hearts, made spasmodic but uncorrelated efforts to check the Red ruin which crept toward them. As well attempt to push back the plague with a gesture of the hands. The thing was inevitable.

On the tenth of January the Reds came to Nikolaevsk, about three thousand of them under the leadership of Trepetzin. They advanced over the snow on skis and sledges.

The Japanese garrison, working in conjunction with the Whites, burned all the outlying structures of the town and then retired into a fort below the city. In this fort was located the Japanese radio station, and through this communication was kept with Tokyo until the end.

Trepetzin besieged this fort and finally captured it. He then turned the guns of the fort on the city with the result that on February 29 the Japanese and the Whites surrendered. Trepetzin permitted the garrison to retain its arms. But the radio station was not again available to the Japanese, with the result that Tokyo's last news of the occurrences was the final message that the fort was capitulating and surrendering to the Reds.

On the twelfth of March the Japanese, assisted by the Whites, attempted an attack upon Trepetzin's troops.

Fighting thereupon recommenced between the Japanese and Trepetzin—the Whites were of little value, for the Red influences and propaganda had completely undermined their morale—and the end of this second struggle was the surrender of the survivors of the garison—134 officers and soldiers.

It was the second time that they had surrendered, and Trepetzin took no further chances but deprived them of arms and lodged them all in prison. Thus ended the last obstacle to Red domination of Nikolaevsk.

While these struggles had been taking place the Chinese had remained quietly on board their ships, taking no part in the fighting and carefully observing neutrality. The winter was a terrible one for them, for they were hopelessly crowded and their restricted diet and close confinement in the ships resulted in much illness and suffering. But with the coming of May and the late spring their spirits lightened and they began to look forward to their release from the dreaded Arctic cold and snow and their speedy departure for their own country. But a new and terrible calamity was about to fall upon them.

It must be remembered that Tokyo's last news of the Nikolaevsk garrison was the radio message that the fort was surrendering to the Reds. After that came a long silence, a silence that months failed to break. It was obvious that with the breaking up of the ice in the early summer a relief expedition would set forth from Japan.

On May 22 Trepetzin learned that Japanese relief forces were approaching. He promptly announced that since he could not hold the city he intended utterly to destroy it.

Here the four gunboats assumed the rôle for which they were created, the protection and relief of their countrymen. The next few days were filled with feverish activity in the ships. There was no way for the Chinese civilians to get out from the doomed city except by water, and the naval officers, after consultation with the civilians, determined to remove their nationals to Mago, a town some thirty versts up the Amur. Securing sampans, junks, and river craft of every description, and loading the four gunboats to their capacity, the trip was made in safety and with no molestation by Trepetzin's forces. Not only were the four thousand Chinese transported but in addition seven hundred White Russians were afforded asylum.

Arriving at Mago the Chinese were disembarked on a long, narrow, low-lying island in the river. The refugees lived in two large godowns, in boats, or under the open sky. Two days after their departure Trepetzin destroyed the city of Nikolaevsk with fire and bombs. It originally boasted two thousand buildings. When Trepetzin finished his work there were seventeen structures left standing.

And on this day which witnessed the end of Nikolaevsk, Trepetzin led his Japanese prisoners out upon the ice still left in the har-

bor. Some of the garrison he shot, but most of the wretched soldiers were pushed through a hole in the ice and drowned. When night came there were no living Japanese left in the desolated place. And Trepetzin, his evil work done, had retreated with his troops.

So the relief expedition from Japan arrived to find the garrison massacred, the city destroyed, and the Reds departed. The commander of the expedition immediately accused the Chinese of having instigated the massacre. He promptly executed over a hundred innocent Celestials on this charge.

Then began a dreadful period for the wretched Chinese. The Japanese would not permit them to leave the island upon which they had taken refuge from Trepetzin's fury. A guardship was maintained by the Japanese to see that this order was enforced. For weeks the starving community had no food other than fish. Such medicine and stores as the gunboats possessed were exhausted shortly after the beginning of this imprisonment. The commander of the Japanese force, though cognizant of their condition, stubbornly adhered to his refusal to let the Chinese depart from the narrow confines of the island nor would he give or sell them any food or medicines. In fairness to the Japanese, it should be remembered that apparently at this time they were rather thoroughly convinced, though upon what grounds is not apparent, that the Chinese had been party to the massacre. The mute bodies of the slain could of course reveal nothing as to their executors, and the absence of the Reds left the commander in a baffled rage.

Each week the Japanese guardship at Mago was changed, sometimes a gunboat, usually a destroyer. Each time the change was made a Chinese naval officer would board the ship and explain the great need of food and medicines. The answer always was that there was nothing to spare. Had the refugees been permitted to scatter to forage for themselves some relief might have been obtained. But herded together as they were they were dying by scores.

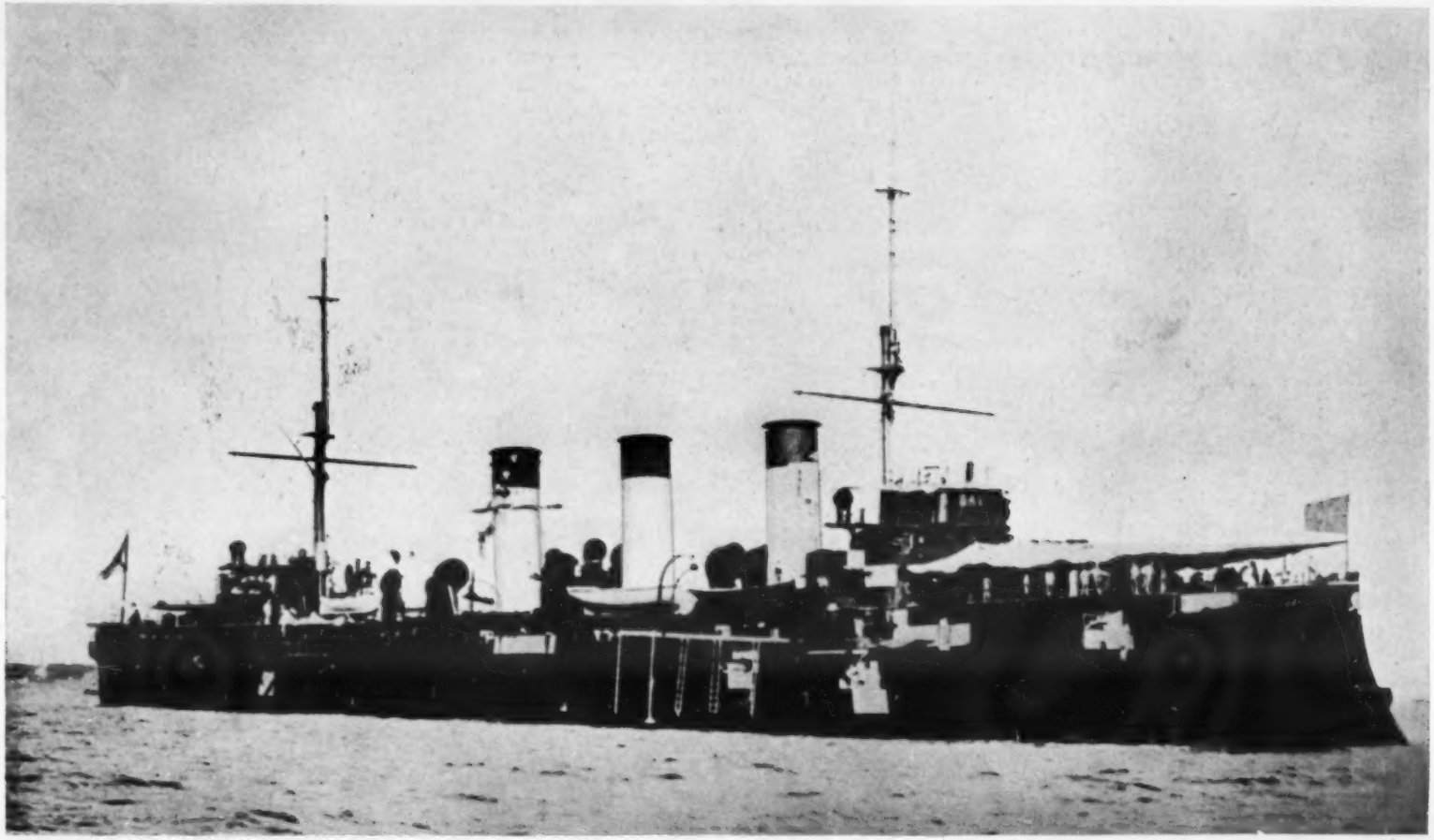
On July 21 the Russian Red Cross ship *Erivan* arrived at Nikolaevsk from Vladivostok, this as a result of the news emanating from Tokyo of the destruction of the city. The Japanese were reluctant to permit the ship to enter the port, but ultimately they ungraciously consented to her anchoring.

The Japanese refused permission for a trip to be made to Mago, but in the end the island was visited by representatives of the Red Cross, and the dreadful conditions were ameliorated by supplies from the *Erivan*. One extraordinary thing about this affair was the condition of the leper colony in the outskirts of the city. Shunned alike by friend and foe, the lepers continued to live there in their usual way and when visited by the Red Cross were apparently comfortable and infinitely better off than the other former inhabitants of the town.

The *Erivan* sailed back to Vladivostok, her errand of mercy completed. And in due time the misfortunes of the four gunboats came to an end. The Japanese finally arrived at the conclusion that the Chinese were not involved in the massacre and released the people from the island. The gunboats ultimately sailed away from the dreadful place which had been their prison and returned to the homes and families of the ships' companies, families who welcomed these sons of the sea back from its bosom as men returned from the grave. But Nikolaevsk lay a ruined city, a miserable collection of makeshift huts and fire-scarred walls, another monument to the desolation of the Red conquest of Russia, a memorial to blind, insensate revolution.

Courtesy Rear Admiral S. Posokhow

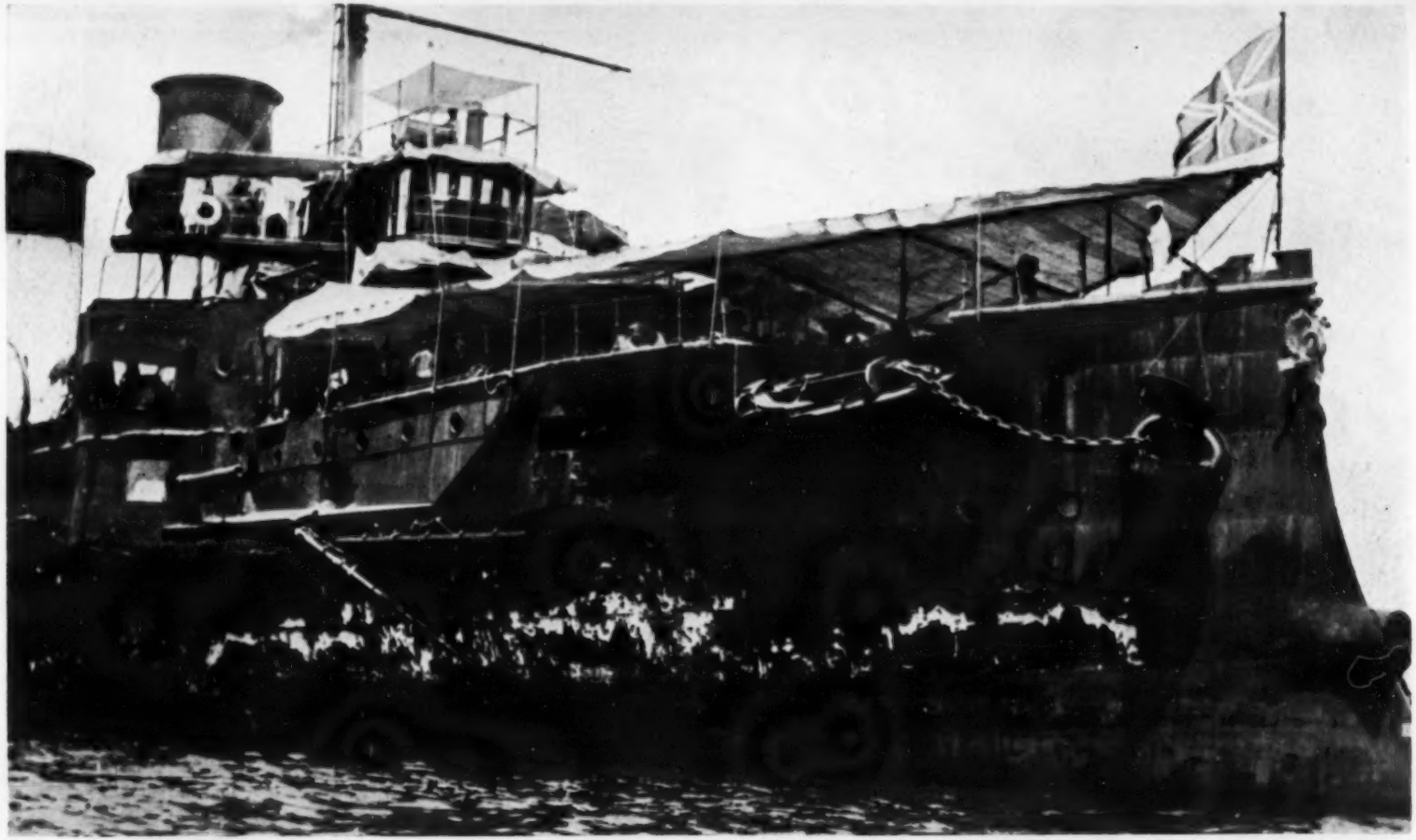
ADMIRAL ROJESTVENSKI'S SQUADRON NEARING THE KOREAN CHANNEL
The morning of May 27, 1905.



Courtesy Rear Admiral S. Posokhow

CRUISER *OLEG* AFTER REPAIRS
The white spots correspond to the repaired shell holes.

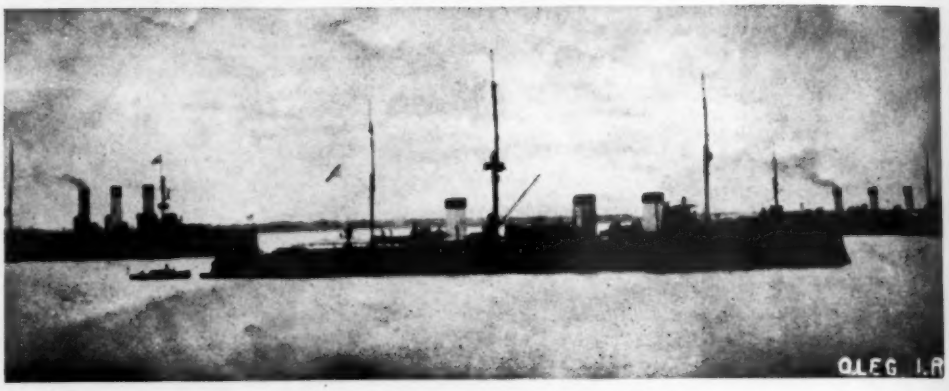
The white spots correspond to the repaired shell holes.



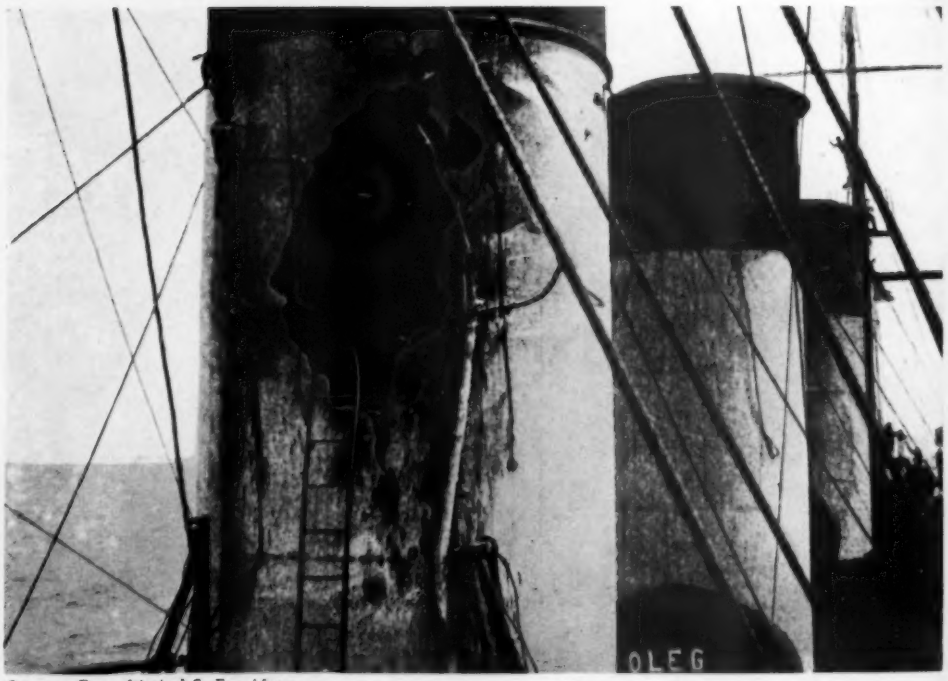
Courtesy Rear Admiral S. Posokhow

THE DAMAGED FORECASTLE (STARBOARD) OF CRUISER *OLEG*

UNIV. OF MICH.

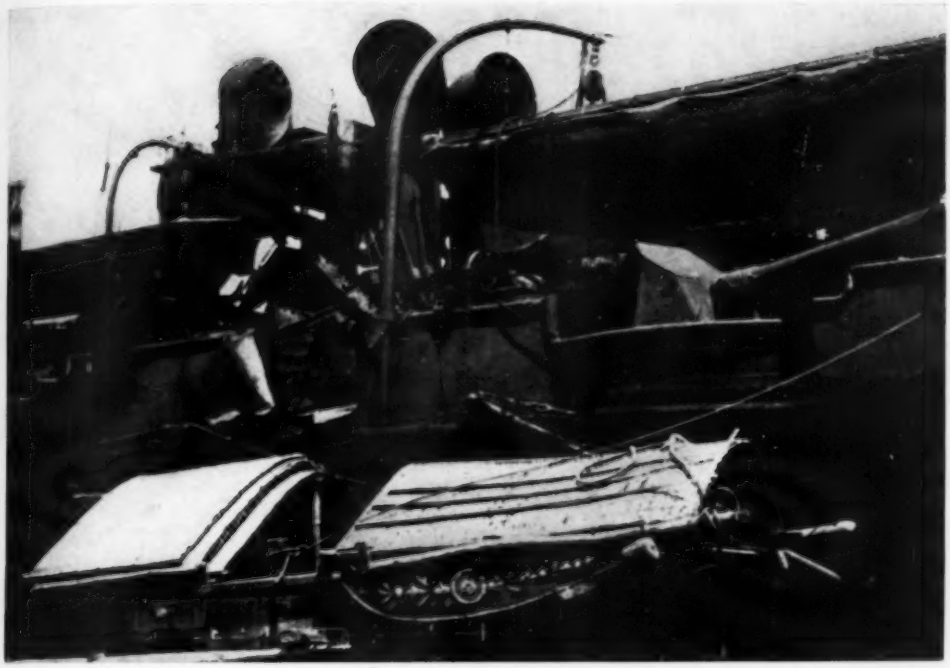


CRUISERS *AVRORA, OLEG,* AND *JEMCHOUG*



Courtesy Rear Admiral S. Posokhow

CRUISER *OLEG*
The shell hole in the fore funnel.

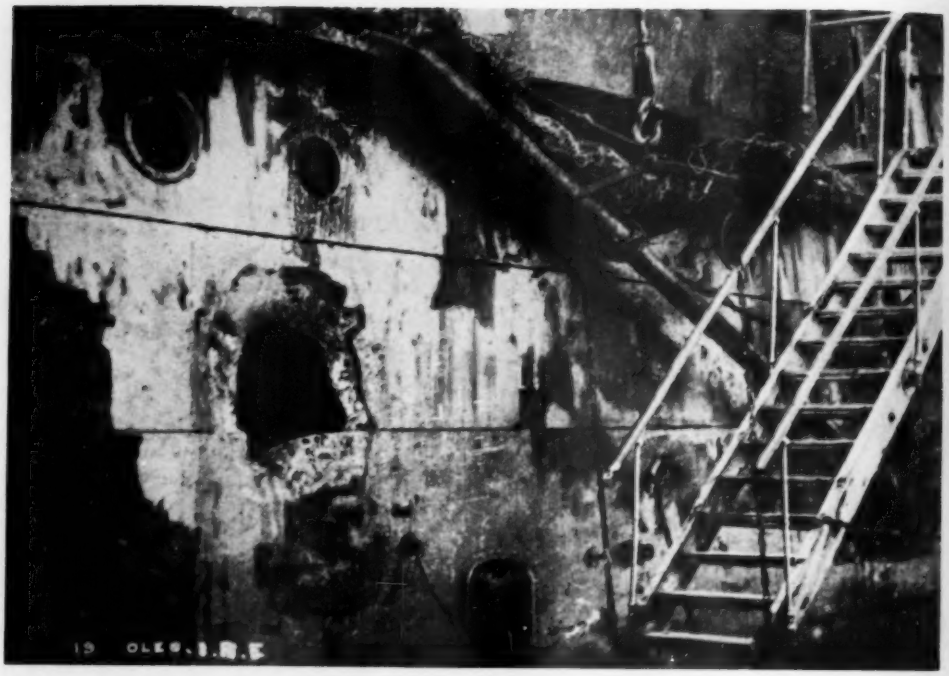


THE DAMAGED BULWARK (HAMMOCK NETTING) OF CRUISER *OLEG*

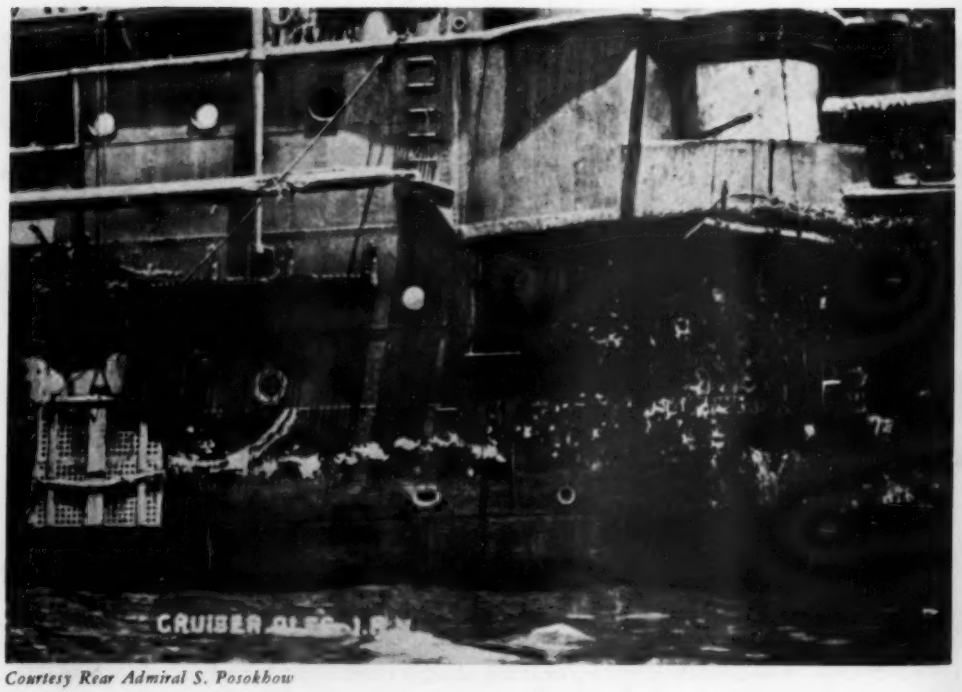
Courtesy Rear Admiral S. Posokhow

A GROUP OF OFFICERS AND CREW OF THE CRUISER *OLEG*
At Kronstadt in the autumn of 1904, before sailing for the Far East.

NIK OF YICH



THE SHELL HOLE NEAR RIB NO. 94, CRUISER *OLEG*

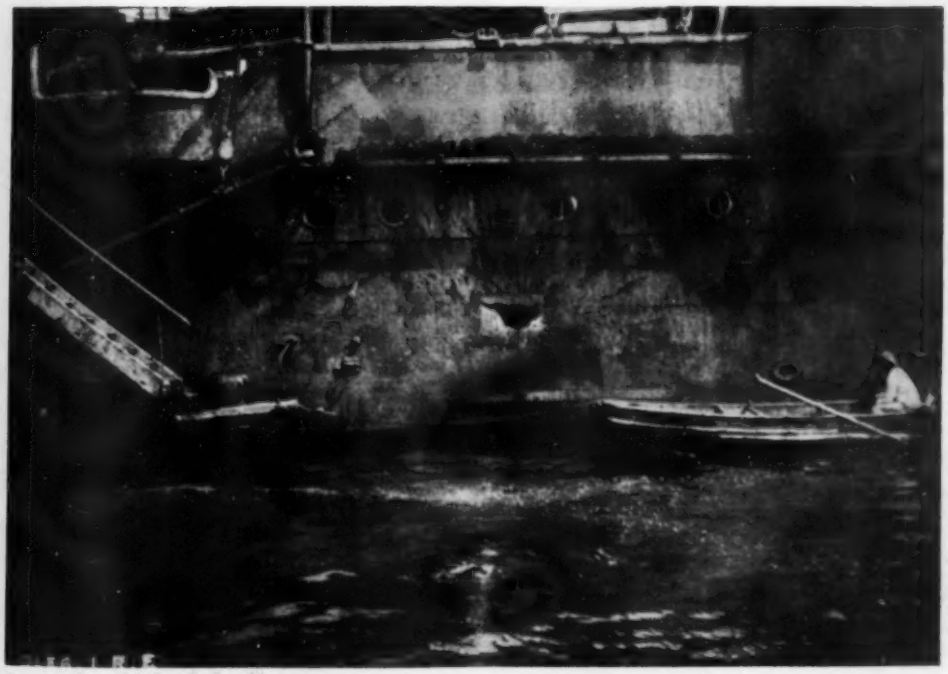


Courtesy Rear Admiral S. Posokhow

THE DAMAGES ON STARBOARD SIDE OF CRUISER *OLEG*

A big shell hole below a 6-inch gun, near the water line (hospital and provisional stores).

SHELL HOLE ON STARBOARD SIDE OF CRUISER *OLEG*
Showing temporary repairs.



Courtesy Rear Admiral S. Posokhow

SHELL HOLE ON PORT SIDE (SHIP'S OFFICE) CRUISER *OLEG*

UNIV. OF MICH.

International Newsreel

THE RED NAVY GOES THROUGH ITS PACES
View of the Soviet Baltic fleet steaming through fall maneuvers.

Recollections *of the* Battle *of* Tsushima May 14-27, 1905, *on* Board *the* Cruiser *Oleg*

By Rear Admiral S. Posokhow, *of the former Russian Imperial Navy*

THE appearance of Admiral Rojestvenski's squadron in the waters of the Pacific Ocean was the decisive moment of the Russian-Japanese War. As the Imperial Russian government had lost all hope of removing the Japanese from Manchuria, it decided to undertake a naval operation in the Pacific, in order to subject Manchuria and Japan to a blockade by an attack on the Japanese lines of communication.

The Japanese, fully appreciating this initiative, gathered all their resources and brought Admiral Rojestvenski's expedition to the catastrophe of Tsushima.

The causes of this disaster were at the time discussed by all naval critics. The specialists were divided into two camps. While one part attributed the Japanese victory to their technical superiority (in guns, speed, explosives) the other, among which were many Russians, explained the Japanese success by the action of their submarines. The Japanese themselves denied any participation of the latter. Notwithstanding this, certain Russians, one of whom was my former chief, captain of the cruiser *Oleg*, Dobrotvorski, were absolutely convinced that the main reason for our defeat was the Japanese submarines.

I took part in the Battle of Tsushima, being executive of the above-named cruiser. Analyzing my impressions after twenty-four years, I can see clearly that the principal cause of our defeat was our technical deficiency and not the Japanese submarines. It would be unjust to blame our officers and sailors. They did their duty to the end with courage.

The pictures of the battle are fixed forever in my memory and even now I have them before my eyes. Moreover, I was able to preserve, in addition to my personal recollections, some records written immediately after the battle.

On Friday, May 26, 1905 (13 of Russian calendar), Admiral Rojestvenski's squadron was approaching the Korean channel. The next day, May 27, happened to be the anniversary of their Imperial Majesties' coronation. Possibly to add a special significance to the battle, Admiral Rojestvenski had diminished speed and spent some time in executing several squadron evolutions. However, the squadron's evolutions did not last long, and towards evening the admiral signaled us his final orders for the coming battle. We learned later that the day was for the Japanese also a solemn day, being the anniversary of their Empress' birthday.

On May 27 the sky was clouded, wind SW, force three. At 5:00 A.M. we received by signal the order to proceed at nine knots. The squadron followed the course NW 60°.

At 6:30 A.M. the battleship *Osliabia* signaled that she had sighted an enemy cruiser on SW 40°. We learned later that it was the Japanese armored cruiser *Asama* which at a respectful distance followed a parallel course to us, informing her admiral of our numbers, order, course, speed, etc.

At 8:15 A.M. eight cruisers of an old type made their appearance from NW 15°. The distance between us diminished and at 9:15 A.M. the battle alarm was given. However, we parted without firing.

At 10:35 A.M., to the NW 60°, we saw again a squadron, composed of light cruisers. Probably they were *Kasagi, Chitose, Nitaka,* and *Tsushima.*

Owing to the fog the outlines of the Japanese warships were indistinct. The distance was approximately 10,000 yards.

View of the Soviet Baltic fleet steaming through fall maneuvers.

At 11:13 A.M. the third-class battleship *Admiral Oushakow* fired the first shot and immediately the whole left column opened fire on the Japanese cruisers. The enemy answered our fire, approaching from 9,000 to 6,000 yards, then breaking off the action, disappeared in the fog.

As soon as the first shot was fired our chaplain walked round the cruiser carrying a crucifix and holy water, encouraging the crew and giving a blessing before the battle.

At 11:19 A.M. the whistles announced "Break off!"

True to the ancient naval tradition, the crew wore this day their new white jackets and had prepared for the battle as if for a holiday. After the first engagement was finished the crew were allowed to have dinner.

At 1:40 P.M. we saw on the horizon ahead and to port the outlines of the Japanese main forces.

Soon we could recognize four battleships and eight armored cruisers making for our flagship of the left column, the battleship *Osliabia*.

At that moment our first battleship division took its place ahead of the second and third battleship divisions, forming thus a line composed of:

First Division: *Prince Suvarov, Emperor Alexander III, Borodino, Orel.*

Second Division: *Osliabia, Sissoi Welikii, Navarin, Admiral Nakhimow.*

Third Division: *Emperor Nicholas I, General Admiral Count Apraxine, Admiral Seniavine, Admiral Oushakow.*

The Japanese warships had been painted a light blue-gray and it was very difficult to discern them from the water, while their coal produced no smoke at all.

Our squadron was painted black, with yellow funnels. Our coal gave a thick black smoke.

At 1:50 P.M. we opened fire simultaneously with the Japanese. After half an hour, i.e., at 2:20 P.M. the after funnel of *Prince Suvarov* was shot away. Ten minutes later the battleship *Borodino* left the line. After hurried repairs she rejoined the rear of the column, behind the third-class battleship *Admiral Oushakow*.

The squadrons, having met each other on opposite courses, were drawing away from each other. To avoid this Admiral Togo undertook a risky maneuver. He ordered his squadron to turn, aiming to fall on a course parallel to ours. This was done at 2:45 P.M.

The maneuver was very dangerous for the Japanese, as their ships, arriving at a certain point, executed in succession the turn to the left and became, so to speak, immobilized.

On the other hand, those who had finished the evolution covered the ships which were following their original course.

Unfortunately, we missed this opportunity and Admiral Togo, having successfully executed his maneuver, continued to shell us, concentrating all his fire on our flagships, *Prince Suvarov* and *Osliabia*. These two battleships were surrounded by columns of water produced by shells exploding in the sea and by smoke and flames.

The *Osliabia* could not stand this fire and, precipitately abandoning the line, listed to port and sank. One could see at that moment groups of sailors, clad in white, falling from the decks into the water. The sight of the sinking battleship was terrible. It produced on all of us a strong impression, like a knife struck into our hearts.

At 2:40 P.M. the Japanese light cruisers *Kasagi, Chitoze, Nitaka,* and *Tsushima* appeared to the SSW. We (the cruiser *Oleg*), turned and opened fire to port.

The Japanese shells, contrary to ours, exploded not only on touching solid objects but also at the least resistance, and produced numerous explosions followed by thick and persistent smoke. When they fell into the sea they threw up great columns of water. They were more like mines than shells and as mines they produced the same effect at short and long distances. For such shells the mass and initial speed were of little importance, as the effect was due not to the strength of shock, but to the force of the explosion of their charge.

This new invention gave the Japanese an immense advantage over our shells because they could see where their own shells fell and could correct their fire. Further, they could fire at greater range and cause damage not only in hitting the mark, but even when the shells fell into the sea near our ships. The columns of water blinded the eyes of our crews and obscured the marks on the optical instruments. The explosions on deck and the shell splinters caused heavy losses in men.

At 3:30 P.M. the Japanese cruisers *Matsoushima, Itsoukyshima, Hashidate, Souma,* and the battleship *Chin-Ien* made their ap-

pearance on our left. We were obliged to fight to port as well as to starboard.

Unfortunately, the 6-inch shells of the *Oleg* could not always reach the enemy, while the latter's 8- and 12-inch shells inflicted serious damage on us.

We avoided disaster only by frequently changing our speed. Changing from full speed to slow, we succeeded in avoiding the enemy's fire.

At about 4:00 P.M. the transport *Oural* sank. During her agony, to save her crew the tugs *Rouss* and *Svir* hurried under violent fire to her help. These two small ships heroically did their duty.

At the same time, at 4:05 P.M., we saw *Suvarov* out of line without masts and funnels. Our battleships, having changed their course, formed a protective screen around the *Suvarov*. The cruisers followed the battleships in line formation. Half an hour later the flagship, completely dismantled, succeeded in following the squadron and took the last place in the column.

Night began to fall.

At 4:50 P.M. our battleships, under pressure of the Japanese from the north, turned to the NW and a quarter of an hour later the battleship *Alexander III* left the line. The cruisers followed the battleships.

At 6:00 P.M. the flagship signaled that the admiral handed over command of the squadron to Rear Admiral Nebogatov. A little later the battleships turned to the westward.

A fire broke out on the *Borodino*. Probably it was the captain's bridge and the ship's boats which were on fire.

The battleship *Alexander III*, which had reëntered the line, was again obliged to leave it.

At 6:35 P.M. the destroyer *Bouiny* signaled: "Admiral Rojestvenski is on board," and took direction to the southward.

In the rays of the sinking sun we could see several lines of Japanese destroyers barring our way to the north. They seemed to be immobile. We opened fire, but without results, as the distance was too great.

At 7:00 P.M. the battleship *Alexander III*, after hurried repairs, took her place at the rear of the column.

At 7:20 P.M. the *Borodino*, which headed the column and was firing vigorously, suddenly sank. This was so unexpected and precipitate that it seemed as if the battleship *Orel* which followed her had no time to change her course and passed over the tomb, freshly closed and still moving, of her fighting comrade.

At 7:15 P.M. the battle began to break off gradually, but desultory firing continued.

Night came and the Japanese destroyers began their attack, aiming to accomplish the work executed during the day by the guns of their fleet.

Towards 7:30 P.M. our whole squadron followed the course to the southward and towards 8:00 P.M. we repulsed the first destroyer attack. The darkness did not allow us to distinguish our own ships from the enemy.

The guns continued firing. Several times we turned to north, northwest, and northeast, in order to join our squadron and break through to Vladivostok, but all these attempts were of no avail. Each time we met either Japanese ships of the line or their divisions of destroyers. However, by continually changing course and speed we succeeded in avoiding the torpedoes of the attacking forces.

This lasted up to 10:00 P.M. At that moment we abandoned all hopes of breaking through to the north and, having lost touch with the squadron, we chose a course to the SW 45°.

We could not steam around Japan by the east as our engines were in bad condition. Besides, one of our high-pressure cylinders, which had already burst at Kronstadt during tests and had been repaired, was letting steam escape. It was impossible for us to obtain full speed; moreover, our coal reserve was insufficient for the voyage. Admiral Enquist, who had his flag on the *Oleg*, therefore decided to turn south and seek refuge in the neutral port of Manila, in the Philippines.

The night passed in anxious expectations of the enemy and in constant working of the pumps in order to clear the ship of water which had entered through the shell holes. During the night the wind fell and the sea became calm. The rising sun accentuated the awful picture of our ship after the battle. All the decks were covered with dirt from wet coal dust and smoke; disorder everywhere; planking damaged by shells; boats destroyed. Everywhere signs of burning and destruction, as after a great fire.

The morning, May 28, at dawn we saw that the cruisers *Avrora* and *Jemchoug* were following us and we learned that the captain of the former had been killed. The admiral therefore decided to take command of this ship and transferred to her with his staff and flag.

The cruiser *Oleg*, besides damages to her engines, had twelve shell holes. The losses in men were relatively insignificant: two officers slightly wounded, eighteen sailors killed and fifty-six wounded.

Our course was to the Straits of Formosa.

At that time a group of officers (Lieutenants Mishtovt, Zaroudny, Politovski, Domershikow and others), addressed me asking permission to hold a council of war, to deliberate the question as to whether we had to abandon definitely the attempt to break through to Vladivostok or to try once more. I expressed my opinion that in the present weather conditions, with small supplies of coal and a damaged engine, the chances of reaching Vladivostok were almost nil. However, preferring an honorable end in battle to internment in a neutral port, I authorized the senior officer to hold the council and told him I was in favor of sailing north. Personally, I could not abandon the work of repairing the shell holes and attend the council. After the deliberations the officers returned and informed me that the majority was for asking the admiral to turn north.

With this decision I went to see, first, the captain, asking him to approach the admiral in order to change our course and once more to break through to Vladivostok. Captain Dobrotvorski's reply was very near my own conclusion, but, considering that there was no chance of success, he did not see any reason for bringing the cruiser and her crew to useless destruction and refused to go to the admiral, leaving it to me.

Admiral Enquist was on the captain's bridge when I came and reported to him. After hearing me he embraced me and answered with tears in his eyes:

"I understand yours and your officers' act and noble intentions. As an officer I entirely share it, but as an admiral I can't agree with it. All last night we tried to break through, unsuccessfully. The enemy's squadron, almost at full strength, and their destroyers barred our way. Several times we changed our course before falling finally to south. Now it's too late. To sail north means to bring to certain disaster your cruiser and the cruisers *Avrora* and *Jemchoug*. I am old, I have not long to live, but besides me there are more than 1,200 young lives which can be useful to our country. No, my friend, tell the officers that although I share with all my heart and appreciate their desire I cannot agree with it. I undertake the full responsibility for everything!"

So failed our attempt to try to turn again to the north.

A little later Lieutenant Domershikow insisted on my giving him the long boat for sailing with volunteers to Vladivostok. That of course, I could not allow.

During lunch in the mess in the captain's presence the question was put, where to go? To Shanghai, or further to Manila, or Saigon? After a detailed discussion and balloting it was decided to sail to Manila, in the Philippines, as a more distant port, in the hope that the Americans would allow us to leave the port after we had made necessary repairs.

On May 28 the weather was fine and the sea calm. We made temporary repairs, employing for this purpose everything that came to hand: mattresses, planks even, to stop the holes.

During our voyage towards the Philippines we still had a difficulty to surmount. The rapid fall of the barometer, with the regular modification of the wind, showed us without doubt the approach of a typhoon, very common in these seas. During the night the weather became rough. Immense waves broke on our port side which was fortunately undamaged. If the same storm and the waves had taken us on the starboard side our position would have been critical, as the temporary repairs would not have been able to withstand them.

On approaching Manila, after reading a service we buried at sea our comrades who had been killed or died from their wounds. During the evening of June 2 or 3 we entered the harbor of Manila and dropped anchor.

During the last hours we could steam but slowly as the coal was almost gone; the boiler pressure fell and the electricity almost failed. We were obliged to burn hemp, tar, planks, etc.

After "Let go!" we breathed more easily, but I cannot say that we felt secure because we did not know what the future would bring to us.

Our anxiety was justified.

Shortly after we anchored a captain on the staff of the American admiral, following the usual sea custom, came to call on us and we learned the first sad news. Admiral Rojestvenski, gravely wounded, had been captured.

The division of Admiral Nebogatov, consisting of the battleships *Emperor Nicholas I, Orel,* third-class battleships *Admiral Seniavine* and *General Admiral Count Apraxine,* had been captured by the Japanese and with the St. Andrew's flag replaced by the Japanese flag, they were brought to Japan.

This news had on us the effect of a thunderbolt. In our fleet, through over two hundred years of its history, there had been only one case of hauling down the glorious flag of St. Andrew before an enemy. This was when the *St. Raphael* surrendered to the Turks. The Emperor Nicholas the First, wishing to wash off this infamy, ordered the Russian Fleet to find this ship wherever she might be and to burn and sink her. This order was executed.

Admiral Nebogatov's surrender was all the more incomprehensible and unpardonable as one of the last orders of Admiral Rojestvenski read: "On preparing the ship for battle make sure that, in case of being surrounded by superior enemy forces and unavoidable disaster seems certain, everything on board is ready for blowing up the ship and sinking her." All preparations for this had been made on board the *Oleg.*

As to the fifth ship of the same division, the third-class battleship *Admiral Oushakow,* she had refused to surrender, preferring a heroic death. At the Japanese signal, "Surrender!" *Oushakow* replied with a salvo of all her guns and then, opening her sea cocks, sank below the water. Part of her crew remained on the surface clinging to floating wreckage. The Japanese, recognizing this heroic act, did all in their power to save the survivors and afterwards, when they were prisoners of war, their arms were restored to them and they were treated with consideration.

After an exchange of telegrams between the American and Russian governments, Washington insisted on our disarmament. The gun breechblocks were handed over to the American authorities. I cannot forget the painful moment when the chief artillery officer, Lieutenant Zaroudny, delivered them with tears in his eyes.

We remained at Manila until the end of the war, the ratification of the Treaty of Portsmouth allowing us to return to Russia. We profited by our stay at Manila to make the necessary repairs and to equip the crew, who had great need of clothing after so many months of voyaging. During the trip the cabins had been transformed into coal bunkers and the men's clothes were in holes. After repairing the shell holes in the plates of our ship they were painted white. A photograph, taken at this time, showed the excellence of the Japanese fire and the places where the ship had been hit.

Through the newspapers we learned that only the auxiliary cruiser *Almas* and a few destroyers had been able to force their way to Vladivostok.

The cruiser *Isoumroud,* having managed to get through the Japanese lines, had gone ashore in a bay not far from Vladivostok. Finding it impossible to refloat the ship, her crew destroyed her.

Thus the battle was lost. The Japanese had won a brilliant victory. This success was due to the great superiority of their speed over ours (seventeen knots against nine), to the range of their guns, their methods of shooting (covering), to the use of high-explosive shells ("Shimoza"), giving numerous splinters, and principally, to the state of preparedness of their ships and the training of their crews.

The awful debacle of our squadron produced on all of us a very painful impression. We saw clearly that we had paid dearly for our deficiency. The lesson was costly but profitable. After the war ended our Admiralty at once began the reorganization of our fleet. Its active units were entrusted to the experienced, energetic, and never-to-be-forgotten Admiral Nicholas Otto von Essen. Under his leadership the fleet gained new life. The men-of-war ceased to be laid up for the winter and with their personnel were in commission all the year round.

As it was impossible to replace speedily the line ships the Admiralty concentrated at first on building destroyer divisions and detachments. Each summer was spent in maneuvers, target and torpedo practice. The liaison service was brought to a state of high efficiency.

When in 1914 the Great War broke out our comparatively small fleet, already reenforced by squadrons of line ships and

cruisers, was not only able to hold in check the much more powerful German Fleet, but also to keep it continually on the alert, in expectation of attack.

In finishing my recollections of this historical and tragic event, I cannot help but mention the high post-battle nervous tension of all of us, which expressed itself in aural and optical hallucinations. The next day after the battle, when the fighting had entirely ceased, many of us imagined that we heard guns booming from different points of the compass. Later on, following a southwest course and when on the meridian of the Straits of Formosa, at about noon, first one, then several columns of smoke were thought to be seen on the horizon to the south. We searched for them anxiously. Soon the ship's outlines were discerned. All our telescopes and binoculars were trained in this direction and everybody on the bridge, including our best signalmen, discovered Admiral Nebogatov's division making for the straits. It turned out to be a mirage, as we afterwards learned that at this moment Nebogatov's division, far away to the north, had been surrounded by a superior enemy force and surrendered.

Gas Defense Afloat

By LIEUTENANT COMMANDER ROBERT B. CARNEY, *U. S. Navy*

DESPITE a very general revulsion against the use of gas in warfare, the gas menace cannot be ignored. This is particularly true in the case of the Navy; gas attacks might sway the tide of battle along a sector of the front, but the likelihood of securing ultimate victory by the use of gas is far less on land than would be the case if a successful gas offensive were employed in a major fleet action. It is conceivable that the entire complexion of a sea campaign might be altered at one stroke should one fleet employ gas as a surprise measure against an unprepared adversary. Even if we learned in advance that gas attacks might be expected, a tremendous expenditure of money and time would be required to properly equip our ships and train their crews to meet this threat. We must, therefore, accord this problem the full measure of study in order that effective gas protection may be developed, and having solved the problem, or made reasonable progress in its solution, we should provide such protection without undue delay.

Chemical warfare research has determined the effects of various noxious gases on men and material, and progress has been made in the matter of gas masks and gas-proof clothing. An educational program, having as its object the familiarization of personnel with the use and care of gas masks, has for some time been in effect. However, there is much to be learned about gas defense and especially about gas integrity, and a suitable hulk should be made available for an exhaustive study of the problem of gas defense afloat. This research would, of course, include the development of satisfactory gas-tight voice tubes, gas filters for ventilating sets, effective gas-tight sealing of compartments, gas masks permitting wide range of vision and good communication over telephones and voice tubes, and methods of expelling or neutralizing gases that had entered the ship. Until those problems are solved, our ships are dangerously vulnerable, and until the methods of insuring gas integrity have been perfected, full recommendations for gas-defense measures will, of necessity, remain an unrealized dream. Granted that naval architects and designers are still perplexed over serious obstacles in their study of this important subject, nevertheless, it would seem that little progress will be made in actual construction unless we set a definite standard and strive to meet the conditions of that standard. If that assumption is correct, it is highly desirable to enunciate the gas-defense requirements of ships, state those conditions as requisites of design, and then endeavor to evolve methods and material to meet the requirements.

However complicated the *solution* of the Navy's gas problem may be, the problem itself may be simply stated. Briefly, we must sufficiently protect personnel and material from the effects of gas to permit the ship to carry out its assigned task. It is not the intent of the writer to discuss the properties of the various lethal gases; that information, for the purposes of this paper, is presupposed to be available. The Navy's problem is to deny as far as may be practicable the entrance of gases to stations manned in battle, and to protect personnel who for any reason may be exposed to the effects of such gases.

Obviously, complete gas protection cannot be afforded to all personnel. Men whose stations are in the open cannot be guaranteed the immunity existing in a compartment that is gas-tight and equipped for purifying and recirculating air. Furthermore, there are many stations in the interior of the ship that do not merit complete protection due to their relative unimportance. Still another factor enters into the question: stations vary widely in their adaptability to gas protection even in spaces entirely within the hull; for example, it would be futile to attempt to seal gas-tight the hangar of an airplane carrier

without causing complete paralysis of a principal function of the ship. From the foregoing it will be apparent that in determining the degree of gas protection which may be given to the personnel of any station, the decision must be based on a study from two entirely different angles: (a) importance, and (b) feasibility.

The ideal of perfect protection for all stations cannot be considered seriously at this time, due to the weight and expense of material involved, and because in many cases a great reduction in efficiency would result. Five degrees of gas protection may be considered to be available:

(1) Complete protection, involving gas-tight sealing of the compartment and the installation of an air purifying and recirculating device.

(2) Protection afforded by gas-tight sealing, together with the use of soda-lime and oxygen bottles.

(3) The temporary protection afforded by sealing a compartment gas-tight only during the period of the attack.

(4) Prevention of entry of gas into a space by maintaining a pressure within that space.

(5) The protection afforded by gas masks and specially designed clothing.

It will be noted that the first four cases aim at preventing the entry of gases, while the fifth has for its object the protection of personnel against the effects of gases already present. The introduction of gas filters in the air-supply system may be a feature of the fourth case or may be employed in certain other instances. It must be borne in mind that gas may find its way even into spaces designed to remain gas-tight at all times during action, and for that reason all officers and men should be provided with gas masks, and in certain stations with gas-proof clothing, if it will not too greatly hamper their movements.

In arriving at any definite policy in the matter of prescribing gas protection, the weight, time, and cost factors will inevitably lead to a comparison of types of ships. The importance of battleships and aircraft carriers, and the ratio of the value of one battleship or carrier to that of the total number, would appear to justify the greatest expenditure of effort and money on these types; to a less degree cruisers would receive their share; destroyers, owing to their availability in large numbers, together with their frail construction, the necessity of economizing in weight, and their general requirements, would receive far less attention than the classes previously mentioned. In turn, each type of ship on the Navy list would be considered in the light of its importance and adaptability, and so receive its share of the funds made available for equipping the Navy for gas defense.

When a means has been worked out for classifying types in accordance with their relative needs for gas defense, the next step would be the formulation of a policy by which the degree of gas protection afforded each station could be determined. Here again we encounter the difficulty of harmonizing the limitations of cost, weight, adaptability, and importance. It is doubtful if the situation allows of a more definite statement than the following: *The personnel of each station should be afforded the maximum gas protection compatible with the type of service expected of the ship, the importance of the station in the battle organization, the structural characteristics of the station, and the weight, space, and expense involved.*

No one bureau or office can well be charged with the responsibility of determining the degree of gas protection to be provided for all stations of a ship; agreement between operating and design personnel is essential in order that maximum military efficiency may be obtained with the funds appropriated. It is not necessary nor possible to set forth in these pages the methods of gas protection suitable for every station on all classes of vessels; however, a few stations will be selected from different types of ships for the purpose of illustrating the application of the policy set forth in the preceding paragraph. In each case an apparently logical conception of the proper gas protection will be set down together with a brief explanation of the method of arriving at the decision.

(1) *Plotting room* (battleship).—Should be capable of being sealed gas-tight, and should be equipped for the purifying and recirculation of air. This station is vital to the shooting efficiency of the main battery, and the utmost protection should be afforded in order that the possibility of reducing the fire effect will be minimized. Any expenditure is justified to secure full gas protection here, and the characteristics of the plotting

room readily lend themselves to such an installation. The plotting rooms of large cruisers should be equipped in the same manner as those of battleships.

(2) *Central station.*—In all types of ships having this station, it may be considered equally as important as the plotting room in the battle organization, and therefore should be fitted for gas protection to the same extent as is prescribed for battleship plotting rooms.

(3) *The tops* (all classes).—No gas protection should be provided for the tops other than that afforded by masks and special clothing. It has been found impracticable to maintain tops gas-tight, and even were such a project possible, renewal of the air would be necessary in a very short time owing to the large number of men occupying the station. Such gas as would be likely to enter the tops would be in low concentration in all probability, and would be quickly dissipated.

(4) *Secondary battery control and group control stations, antiaircraft control and group control stations, broadside and antiaircraft gun stations* (battleships and other types as applicable).—These stations, like the tops mentioned in the foregoing paragraph, do not lend themselves to any structural protection against gas, and therefore the personnel can only depend on masks and gas-proof clothing.

(5) *Conning tower* (battleships).—The obvious importance of the battleship's conning tower merits the fullest protection against gas, but the accomplishment of this is difficult and presents certain special obstacles. The necessity of good vision from within, and the need for heavy armor protection for the conning tower, are the chief factors in making this a most perplexing problem for designers. Both of these requirements are so obvious as to need no explanation; very small slits are essential in protecting conning tower personnel from fragments, but they also complicate the problem by greatly reducing the possibility of quickly ridding the conning tower of gas that has gained entry. Space limitations would seem to act as a deterrent to the installation of a purifying and recirculating system. Three solutions suggest themselves at the present: (a) so construct the conning tower as to permit of its being temporarily sealed gas-tight; (b) maintain a pressure within the conning tower; or (c) construct the conning tower as a gas-integrity unit with the central station, and thus provide the benefits of the full protection afforded by a gas-tight structure and the purification and recirculation of air.

(6) *Conning towers* (other types).—Equip them to be sealed temporarily gas-tight. There is some doubt as to the extent that the conning towers will be occupied on aircraft carriers and light cruisers. It may be that the conning tower in these types will prove of little use in the sorts of engagements in which they are apt to participate.

(7) *Flag conning stations* (battleships).—It would be unwise at this time to attempt any final statement of the gas-defense requirements of this station other than to say that temporary gas-tight sealing is imperative in order that plot and communications be not interrupted during the period of a gas attack. The difficulty of speaking, or even thinking, while firing heavily and under fire, leads to the belief that most of the work of the admirals in the battle line must be done in sheltered locations, even though the flag officer himself elects to remain outside where he can best see developments.

(8) *Turrets.*—Maintain internal pressure and install gas filters in the air-supply systems. This may not afford perfect protection, but it is the best that can be obtained owing to the very nature of the turret's functions.

(9) *Motor rooms* (electric-drive ships).—They should be capable of being temporarily sealed gas-tight. The effect of certain gases on insulation makes this necessary, but no special equipment should be required, as not more than one or two men would be stationed in a motor room, and the large size of the compartment would insure sufficient free oxygen to sustain life during the period of any gas attack.

(10) *Generator rooms and engine rooms.*—These spaces should, if practicable, be protected against the entry of poison gases, and furthermore, some cooling system should be installed in addition to a purifying and recirculating plant in order to make operating conditions bearable.

(11) *Firerooms.*—Protection of personnel in firerooms presents a problem distinctly different from that involving any other battle station, as the supply of air to the burners cannot be interrupted. Two general solutions seem possible: in the first, the air for

the burners would not enter the fireroom at all but would be taken directly to the burners in gas-tight ducts. Under this system the entire fireroom space could be made tenable in the face of gas attack as there could be no possible contamination from the air supplied to the burners. An alternate method would involve providing the fireroom personnel with gas-proof booths from which all fireroom machinery and mechanisms could be operated remotely. Present fireroom designs are less adaptable to gas protection than almost any other battle station, and if one of the suggested methods is adopted, very extensive alterations would be necessary. Nevertheless, ships must steam, and some means of protecting the fireroom gang must be devised.

(12) *Communication stations.*—The tremendous importance of communications makes it mandatory that communication stations receive all gas protection possible. Visual signal stations probably cannot be given any special consideration in this matter owing to their essentially exposed locations. With radio, however, the situation is different; the various radio stations can all be made capable of being sealed gas-tight, at least temporarily, and in many cases it will be possible to further extend the gas protection measures. Wherever possible, radio central should be given complete protection, and the transmitter rooms, emergency radio rooms, and radiocompass stations should be so constructed as to permit of being sealed temporarily during the period of attack.

On destroyers, the radio room is about the only station that admits of any special gas-protection measures, as the very nature of the ship and its contemplated duties preclude the possibility of any method of gas defense other than masks and gas-proof clothing at the other stations. The destroyer radio room, while readily adapted to gas-defense construction in some ways, cannot be protected to a greater extent than is obtainable by temporary sealing owing to the undesirability of placing additional weights on this already overburdened type.

Submarines are inherently well suited to gas defense; certain of their safety appliances for sustaining life in event of submerged casualty may be considered as gas-defense measures, and may be used as such should occasion demand. The soda-lime and oxygen flasks of the submarine might well have their uses in gas defense in other types where it is not practicable to install more costly, weighty, or complicated plants for purifying and recirculating air.

Organization

Having dealt at some length with the material side of gas defense, it behooves us to proceed to a consideration of the organization necessary in any scheme of gas defense. Assuming that complete protection for all personnel is not feasible, we must face the fact that a large percentage of the ship's company will have to rely on gas masks and gas-proof clothing for protection against the effects of lethal gases. There is no doubt that a man's efficiency is reduced the moment he dons his mask; just what the percentage value of that reduction is cannot be exactly stated, for there is the question of morale as well as the physical factor entering into any such calculation. Continued drill will, without doubt, tend to lessen the evil effects of the gas mask on battle efficiency, but viewed in the light of present experience we must assume that no man works at his best in a gas mask. The same may be said about gas-proof clothing, particularly when men so garbed must labor in high temperatures. Although little is known of the effect on personnel from the sealing of compartments, it may be assumed that voice-tube communications will be less effective and personal efficiency cut down, especially in enclosed, thickly populated stations which are not artificially cooled.

If the foregoing assumptions are correct, then it may be stated that placing a ship in a state of readiness for gas attack will diminish the fighting value of that ship. Under the circumstances, sounding the gas alarm entails great responsibility, and should be the prerogative of the captain alone; by that it is not intended that he should personnally manipulate the contact maker, but his order should be awaited before placing the entire ship in readiness to meet a gas attack. It should be taken as a fundamental, then, that the captain must give the order for the sounding of the general gas alarm.

Next should be considered the question of responsibility for the gas organization of the ship; every major activity and function of a ship is under the direct supervision of some one officer who is charged with the responsibility for its proper conduct. Inas-

much as gas may find its way into any part of the ship, it would seem appropriate that the first lieutenant, or the officer performing the duties normally assigned to the first lieutenant, should be designated as the "gas-defense officer". The forward and after repair parties are under his jurisdiction, and the engineer's repair party is enjoined to call upon the hull repair parties for assistance in the matter of hull damage; the casualty board containing all pertinent hull data is kept at the first lieutenant's battle station; he is the logical officer to undertake this duty, as all other department heads will be engrossed in their major functions to an extent that would not permit of diverting their attention even momentarily. Let us then create the billet of gas-defense officer and assign the job to the first lieutenant. In ships that are not allowed a first lieutenant, some other officer should receive the designation and be charged with the duties of gas-defense officer.

One item remains to be settled before outlining a procedure for the gas-defense bill: what method shall be used to indicate the imminence of a gas attack? That matter will have to be settled for each type of ship separately; special sound signals having distinctive notes should be employed. It is not necessary to go into the mechanical details in this paper.

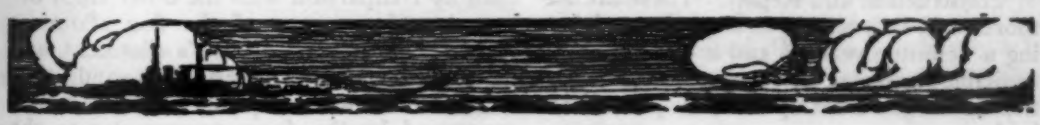
Now let us consider the steps in event of a gas attack on a battleship. (The procedure may be modified to suit other types.) As soon as the presence of gas is detected at any station, the captain should be notified and local measures immediately taken to protect personnel. If the captain considers that the threat is sufficiently serious to warrant sounding the general gas alarm, he orders the gas-defense officer to do so; if, on the other hand, he believes that the threat does not justify reducing the entire fighting value of the ship, he should notify all officers in charge of important fire-control and ship-control units that the presence of gas has been reported, and he should further instruct those officers to be on the alert for gas, to take local measures if gas is detected, and to report at once any further indication of its presence.

When the gas-defense officer sounds the general gas alarm at the captain's bidding, all stations should put into effect the gas-defense measures provided and then report to the gas-defense officer when "Ready"; these reports should be made direct to the gas-defense officer if direct communication exists, otherwise through the officer in charge of the major fire-control or ship-control unit concerned.

The gas-defense officer should collect all reports and after checking and summarizing them, should make a report to the captain. Thereafter, the gas-defense officer should keep informed of the situation, pass on information to the captain, and instruct his repair parties to take whatever action is possible in rescuing personnel and maintaining the gas integrity of the ship.

The casualty board should contain pertinent information regarding voice tubes, ventilating sets, filters, the designed degree of gas-tightness of all compartments, and all similar data that could have any bearing on the gas integrity of the ship and on means of combating the gas menace in time of action.

In conclusion, the writer wishes to say that in this discussion he has endeavored to outline with a few strokes the problems confronting us in preparing to meet a possible gas attack in the fleet; degrees of gas protection have been categorically set forth, a policy for prescribing degree of gas protection has been suggested, and that policy has been applied in certain instances in order that a definite basis for argument would be available. Lastly, the organization phases have been sketched, and a skeleton outline of a type procedure proposed. It is believed that the latest conceptions of gas defense have been faithfully presented, and if there are dissenting opinions, a healthy discussion could not fail to stimulate interest in the subject to the ultimate benefit of the Navy.



Financial Control *of* Ships' Overhauls

By LIEUTENANT COMMANDER G. C. MANNING *(C.C.), U. S. Navy*

THE present method of financing the overhauls of ships of the United States Navy is, with minor variations, essentially as follows: (1) The ship about to have an overhaul prepares requests for all the work which in the opinion of her commanding officer should be performed to place the ship in proper material condition for continued operation in accordance with her mission. These work requests are forwarded through commanders afloat to (a) the navy yard at which the overhaul is to be accomplished in the case of urgent repairs and (b) to the material bureau having cognizance of the work in the case of desirable repairs and alterations. (2) The ship also prepares a "Summary of Work Requests" listing the work requested in order of desirability or urgency from the ship's point of view. (3) The navy yard at which the ship will overhaul makes an estimate of the cost based on rough estimates on the work requested and approved by proper authority. (4) Based on this estimate of the cost of the overhaul and its length, the navy yard requests funds from the various material bureaus having control of them. (5) The material bureaus allot to the navy yard for a certain month certain sums of money, usually indicating how much is to be expended on the various ships scheduled to be under overhaul at that navy yard during the month, but the allotment by ships is usually not mandatory on the navy yard and is modified as local conditions warrant. (6) If during the progress of the work the allotments are found inadequate, additional funds are requested.

The method outlined above is subject to one important exception in the case of alterations under the cognizance of the Bureau of Construction and Repair. These are authorized by that bureau to be performed during a definite overhaul and a definite credit available to receive charges until the completion of the job is set up for each job authorized.

After a number of years of navy yard experience the author presents certain changes in the established procedure which will result in more satisfactory service to the fleet and no additional cost to the Navy. The plan proposed is to give to the commanding officers of ships the control of funds expended during an overhaul.

This procedure is not new. It is the rule in the merchant service and certain federal maritime services where work lists are prepared by the captain, chief engineer, and on passenger ships by the chief steward. Some large companies have port captains and port engineers who scrutinize these work lists, but the more usual procedure is for the agent to authorize a ship repair yard to perform the work requested. Further, in the Navy ships have very substantial allotments for labor and material to be expended on maintenance, preservation, and repair. The plan proposed is essentially an extension of the present system of ships' quarterly allotments.

The procedure proposed is: (1) Let each ship be given an annual allotment equal in amount to the present allotment plus the minimum cost of overhaul of ships of the same class during the previous year or so. (2) Grant to force commanders afloat an allotment equal to the average annual amount they now obtain for reallotment to ships plus the difference between the cost of overhaul and the amounts allotted to all the ships of this force minus a certain safety margin for contingencies to be retained in the bureaus and minus any amount withheld to perform necessary alterations. (3) When a ship is due for her scheduled overhaul the staff of the force commander would go over the work list prepared by the ship and inspect the ship, and by comparison with the other ships determine if any part of the flag allotment should be added to the ship's allotment, and if so, how much. (4) The ship would then transmit the work requests which had been approved by the force commander to the

navy yard for the preparation of estimates. (5) The navy yard would prepare estimates as requested by the ship and transmit them to the commanding officer. (6) The commanding officer would then request the navy yard to perform certain specific jobs in accordance with the estimates prepared by the yard. The commanding officer would be responsible that the estimated cost of work requested should not exceed the ship's allotments. (7) Upon completion of the various jobs the actual charges would be invoiced to the ship. At the beginning of the overhaul the ship would transfer a credit to the navy yard equal to the estimated cost of the overhaul. Shortly after the end of the overhaul, when the charges on all jobs had been entered, an adjustment equal to the difference between the estimated cost of the overhaul and the total charges invoiced to the ship on jobs performed would be made.

An example showing the system for the work under one bureau is given. The ship selected is a destroyer and the bureau having cognizance is the Bureau of Construction and Repair. The application to all classes of ships for work under all bureaus will be similar.

In a certain force are twenty destroyers. The annual Construction and Repair allotment is $4,400 ($1,100 quarterly) for each and the average annual amount obtained for reallotment to these destroyers is $12,000. The average cost of Construction and Repair work on these destroyers during a regular overhaul is $15,000, and those having the least work require $12,000. There are certain military alterations which the Navy Department wants made to these destroyers which will average $3,000 per ship.

The ship's annual allotment is computed as follows:

Present allotment (4 x $1,100)	$ 4,400
Minimum cost of overhaul of destroyers	12,000
Total provisional allotment	$16,400

The annual flag allotment for the destroyers is computed as follows:

Present average amount reallotted	$12,000
Difference between average and minimum cost for 20 destroyers equals 20 x (15,000 —12,000)	60,000
Sum of above	$72,000
Minus 10% retained in bureau for emergencies	7,000
Flag allotment for destroyers	$65,000

A destroyer is scheduled for overhaul; work lists are prepared and sent to the force commander; the staff inspects the ship and finds her somewhat better than average but not as good as the best, and recommends that $2,000 of the flag allotment be reallotted to the ship for her use during the coming overhaul. This recommendation is approved, increasing the ship's funds to $18,400.

The ship sends in its approved list of work to the navy yard for estimates, and the total estimated cost of all work desired is found to be $15,500. The ship, after considering its prospective requirements for work by the ship's force, decides that it cannot afford this amount of navy yard work and therefore eliminates certain items, bringing the total of work requested to $14,750. She then requests the navy yard to proceed on that basis, making a transfer of credit of the above amount to the navy yard. Upon completion of the work the total actual cost is found to be $15,000; the ship therefore makes an additional transfer of credit of $250 to cover the overexpenditure.

It was stated that the ship had alterations amounting to $3,000 to be performed during her overhaul. This work could be financed either as at present, i.e. by allotments direct to the navy yard covering the specific jobs authorized to be done or the ship's allotment could be increased by this amount and the ship directed to have the jobs performed during her overhaul.

The Bureau of Engineering has recently issued instructions for a change of method of financing the overhauls of destroyers of the battle fleet for the fiscal year 1930, which resembles the proposed method in that the control is vested in the forces afloat rather than in the navy yards. In announcing this change of method, the Bureau of Engineering stated that it was being made in an effort to see if the engineering material of vessels concerned could not be kept in proper condition with the appropriations given; that the bureau was convinced that under the present system no greater efficiency in the expenditure of its funds was possible, that is, that the maximum work for the money spent was being obtained, but that the funds granted were not sufficient to accomplish all essential work; that the change of method directed was purely a financial experiment and that its continuance and extension would depend upon the results obtained.

The essential features of this experimental method for financing the work under the cognizance of the Bureau of Engineering for the destroyers of the battle fleet for the fiscal year 1930 are:

(1) A lump sum allotment for all such work is made to the commander, Destroyer Squadrons. This allotment is in addition to the present flag allotment and quarterly allotments to individual vessels.

(2) This allotment will be split several ways: (a) *Time*—The estimated expenditure for each quarter of the fiscal year is to be given. The estimate for the first quarter must not be exceeded, but the underexpenditure in any quarter may be added to the tentative allocation for any succeeding quarter. (b) *Agency performing the work*—The estimated amount of work to be accomplished by the tenders and navy yards is to be determined to enable these agencies to estimate their work load and force. The actual transfer of allotments to be made periodically. (c) *Object*—The estimated amount of work on each vessel must be determined to form the basis of the transfer of allotments to the various agencies for performing the work.

(3) The jobs to be performed on any vessel by any agency are designated by the commander, Destroyer Squadrons, and he is the only official who has authority to authorize work except in case of such extreme emergency which does not permit delay to communicate with him.

Most navy yard organization orders now have a paragraph to the effect that the mission of the yard is to serve the fleet, and the personnel sometimes refer to the navy yards as "service stations to the fleet." But it is necessary to keep reminding people that the ships of the Navy are the navy yard's customers. If the commanding officer has the authority to have such work done as he desires subject only to the approval of his military superiors and (in the case of alterations, to that of the material bureau concerned in addition) provided only he does not exceed his allotment, he would be better satisfied with what he got. Time after time it happens that the nonperformance of an unimportant and inexpensive item of work by the navy yard causes a feeling of dissatisfaction on board ship and bickering all out of proportion to its importance.

The staff of the force commander is in the best position to determine which ships require the largest expenditures to bring them to satisfactory material condition and under the plan proposed the force commander has the funds to allot to the ship needing them.

The fact that all items of work would have to be approved by forces afloat would prevent wasting funds in unnecessary work. Further, the responsibility of the commanding officer for the material condition of his ship would not be reduced. Further, the fact that all alterations would have to be approved by the bureau concerned would prevent the various commanding officers from littering their ships with gear that struck the fancy of a particular commanding officer but which had very limited military value or was positively detrimental to the military efficiency of the ship.

The only objection which the author sees to the recommended method is that it increases somewhat the administrative work of the staffs of the commanders of forces, but it is not believed that this would be serious. The proposed extension of the action of the Bureau of Engineering in directing a change in the method of financing the overhauls of destroyers of the battle fleet for the fiscal year 1930 to the work in other forces and under other bureaus would be an important change in the method of financing ships' overhauls. It is a very timely subject and one to which the entire commissioned naval personnel should give serious thought.

The Weight *of* Sea Water *and* Its Variation *with* Salinity *and* Temperature

By Associate Professor J. B. Scarborough, *U. S. Naval Academy*

THE physical properties of fresh water are well known and are stated in engineers' handbooks and in textbooks on hydraulics. One can readily find, for example, that pure water at ordinary air temperatures weighs about 62.4 pounds per cubic foot and that fresh river water weighs about 62.5. Usually there is added a table giving the weight for various temperatures.

When we consult the handbooks and hydraulic texts for similar information concerning sea water, however, we usually find nothing at all or else the bare statement that it weighs 64 pounds per cubic foot. Even the English and American books on oceanography say almost nothing about the weight of sea water.

The purpose of this article is to give the essential facts as to the weight of sea water and to show just how the weight varies with salinity and temperature. The data relative to temperature and salinity have been taken mostly from the article "Ocean and Oceanography" in the *Encyclopedia Britannica*, and the temperature coefficients needed in the computations have been taken from Knudsen's *Hydrographical Tables*. Formula (1) was obtained by combining two formulas given in Knudsen's tables, and (2) was taken from the tables directly. Formula (4), near the end of the paper, was derived empirically from known values of the weight of sea water of different salinities.

The weight of sea water depends principally upon its *salinity*, which is defined as the number of grams of dissolved salts in 1,000 grams of sea water. Thus, S=35.7 means that there are 35.7 grams of dissolved salts in each 1,000 grams of the sea water in question. In all the formulas of this article the salinity must be expressed as parts per thousand and not as percentages.

The weight of sea water depends also upon its temperature, but to a far less extent than upon salinity. And whereas the weight varies directly with salinity for a given temperature it varies in a quite complicated manner with changes in temperature. The fundamental formulas for computing the weight of sea water when the salinity and temperature are known are as follows:

$$(1)\quad \sigma_0 = -0.0934 + 0.81488S - 0.0004825S^2 + 0.000006768S^3$$

$$(2)\quad \sigma_t = \Sigma_t + (\sigma_0 + 0.1324)[1 - A_t + B_t(\sigma_0 - 0.1324)]$$

$$(3)\quad W = 62.424(1 + \sigma_t/1000)$$

Corresponding values of σ_0 and S are tabulated side by side in Knudsen's tables. Hence it is not necessary to compute σ_0 from (1). The quantities Σ_t, A_t, B_t, are functions of the temperature alone and are given in Knudsen's tables by steps of 0°.1 from —2°C to 33°C. Their actual values in terms of the temperature t (Centigrade) are:

$$\Sigma_t = -\frac{(t-3°.98)^2}{503.570} \times \frac{t+283°}{t+67°.26}$$

$$A_t = t(4.7867 - 0.098185t + 0.0010843t^2) \times 10^{-3}$$

$$B_t = t(18.030 - 0.8164t + 0.01667t^2) \times 10^{-6}$$

The factor $(1+\sigma_t/1000)$ is the specific gravity of sea water at t°C, and the number 62.424 is the weight of a cubic foot of distilled water at 4°C.

The salinity of the open seas and oceans varies from 1 to 43. The Baltic Sea has the lowest and the Red Sea the highest, the averages for these two seas being 7.21 and 39.76, respectively. The saltiest ocean is the Atlantic, having an average salinity of 36.01. The salinity of the oceans varies with the latitude, being lowest in the equatorial and polar regions and highest in the belts lying from 20° to 30° north of the equator and

from 10° to 25° south of it. The salinity limits for the Atlantic are from 34.5 in the equatorial regions to 37.9 in the North Atlantic, and for the Pacific they are from 33.5 in the East Pacific equatorial belt to 36.9 in the South Pacific. For the Indian Ocean the salinity varies from 34.0 to 36.7. The average salinity for all the oceans is between 34.5 and 35.0.

The surface temperature of the oceans varies from about —2°C up to 32°.2 C (90°F), and it goes even as high as 34°.5 C (94°F) in the Red Sea. The average for all the oceans is about 17°.5 C (63°.5F).

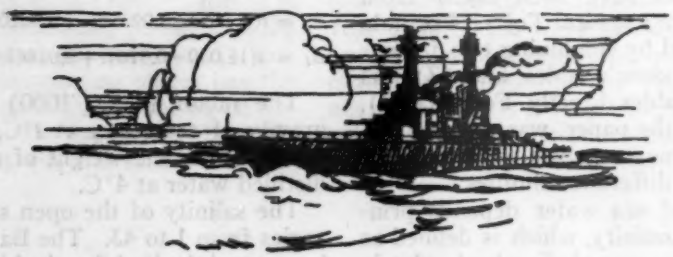
Let us now see how the weight of sea water varies in different localities over the earth's surface. On substituting in formulas (2) and (3) the appropriate values of temperature and salinity for the several localities named above we find that the weight per cubic foot varies from a minimum of 62.70 for the Baltic in summer to a maximum of 64.30 for the Mediterranean and Red Sea in winter. For the Atlantic Ocean the weight varies from 63.82 to 64.15, and for the Pacific it varies from 63.77 to 64.10. In the China Sea, with a salinity of 25, it drops as low as 63.50. The highest known specific gravity for the open seas and oceans is 1.031, which gives 64.36 for the weight of a cubic foot of water. In the case of the Dead Sea and Great Salt Lake, however, the water sometimes weighs as high as 75 pounds per cubic foot. The average weight for all the oceans at the average temperature of 63°.5 F is 64.0, and this is why sea water has the reputation of weighing just 64 pounds per cubic foot.

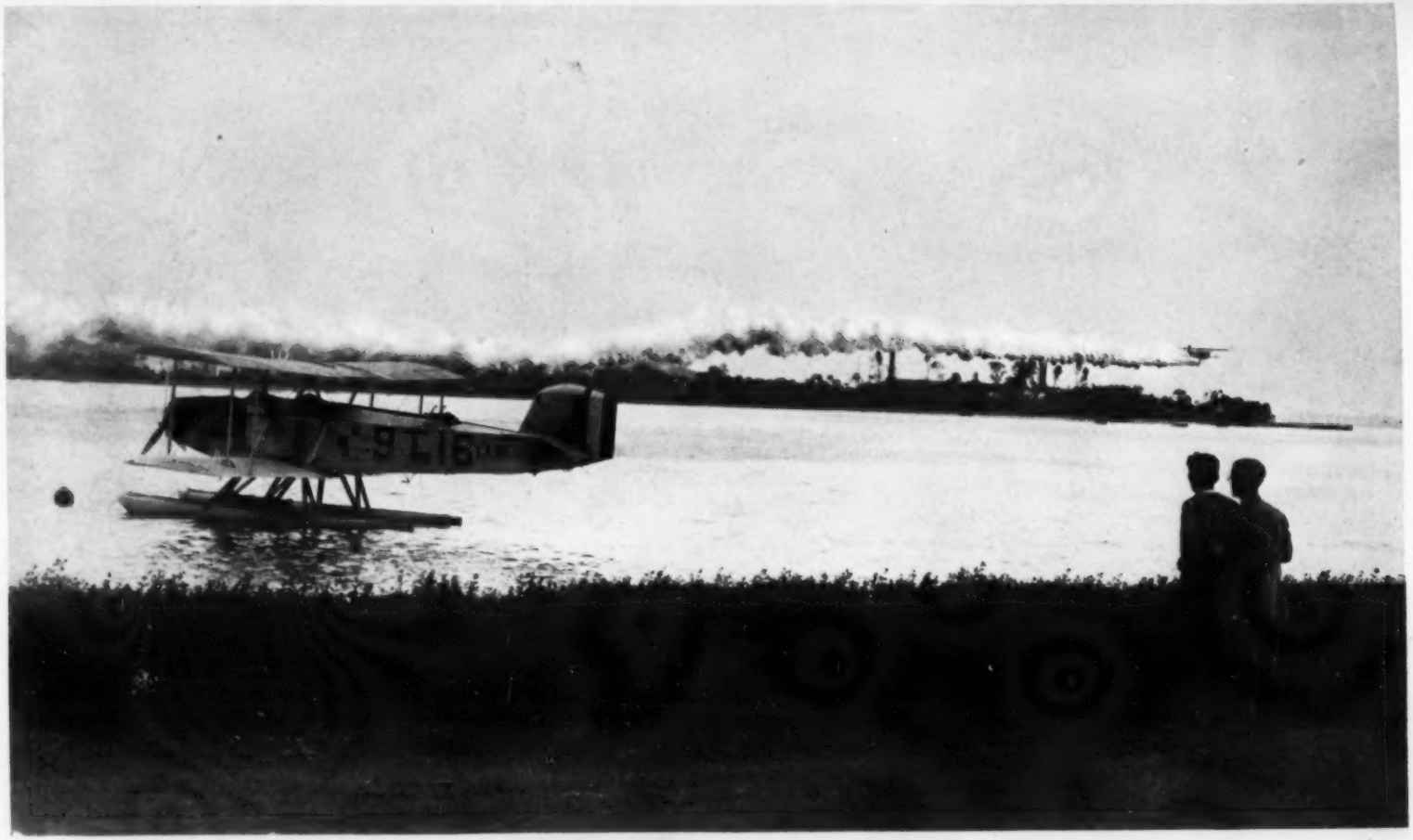
The following simple formula will give the weight of sea water correct to four figures for all salinities when the temperature is around 63°.5 F:

$$W = 62.345 + 0.04766S \tag{4}$$

From the foregoing discussion it is plain that in calculations involving the weight of sea water the final results should never be given to more than three significant figures unless the weight of the water is known accurately. The same remark applies to calculations involving the weight of fresh water. In either case we should state the results to three significant figures and no more.

By means of formulas (1), (2), and (3) one could compute a double-entry table giving the weight of sea water for various temperatures and salinities. There is some need for such a table, for it would at least perform an educational service by showing at a glance that sea water does not weigh exactly 64 pounds per cubic foot.





International Newsreel

THE NAVY SHOWS HOW A SMOKE SCREEN IS LAID

An aërial smoke screen being laid between the Naval Air Station, Anacostia, D.C., and the Army War College.

Courtesy Lieutenant Colonel Ernst Otto, German Army

A 38-CM GERMAN QUICK-FIRING GUN, A RAILWAY PLATFORM GUN, BEING FIRED

Range 48 kilometers. The former marine gun for heaviest flat trajectory fire was called "Long Max" by the regimental officers and men after Vice Admiral Max Rogge, who directed the use of the guns by the land Army.

(Published by special permission from original war pictures)

Courtesy Lieutenant Colonel Ernst Otto, German Army

TAKING THE ELEVATION OF THE GERMAN 38-CM QUICK FIRING, RAILWAY PLATFORM GUN

On top of the gun is the compensating weight which was necessary to balance the great weight of the long gun.

(Published by special permission from original war pictures)

UNIV. OF MICH.

Courtesy Lieutenant Colonel Ernst Otto, German Army

THE 38-CM RAILWAY PLATFORM GUN WAS CAREFULLY HIDDEN FROM THE EYES OF THE OBSERVING AIRMEN

Men are seen taking mats and branches from the gun to make it ready to fire.

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Courtesy Lieutenant Colonel Ernst Otto, German Army

BRINGING UP THE SHELL FOR THE GERMAN 38-CM RAILWAY PLATFORM GUN

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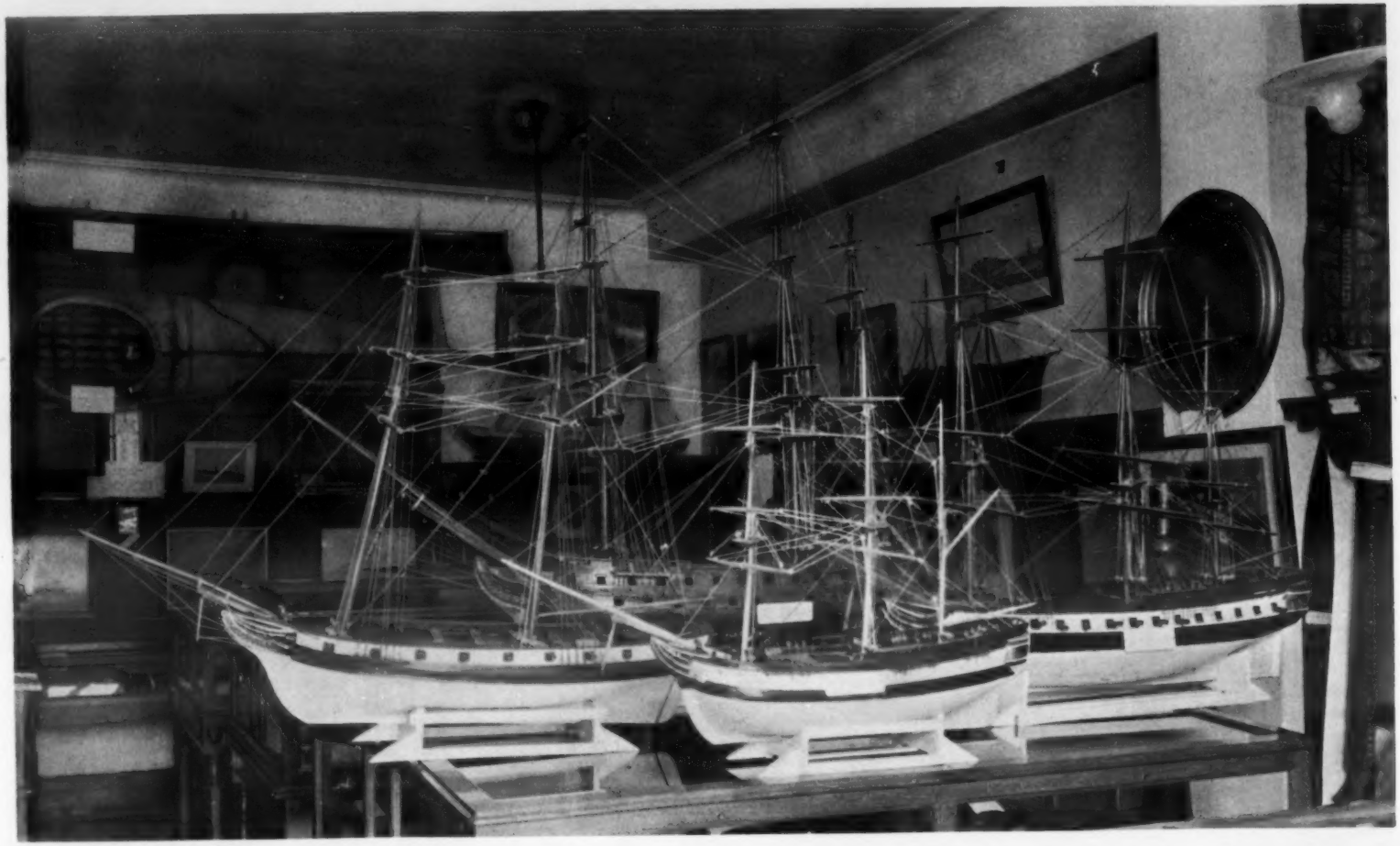
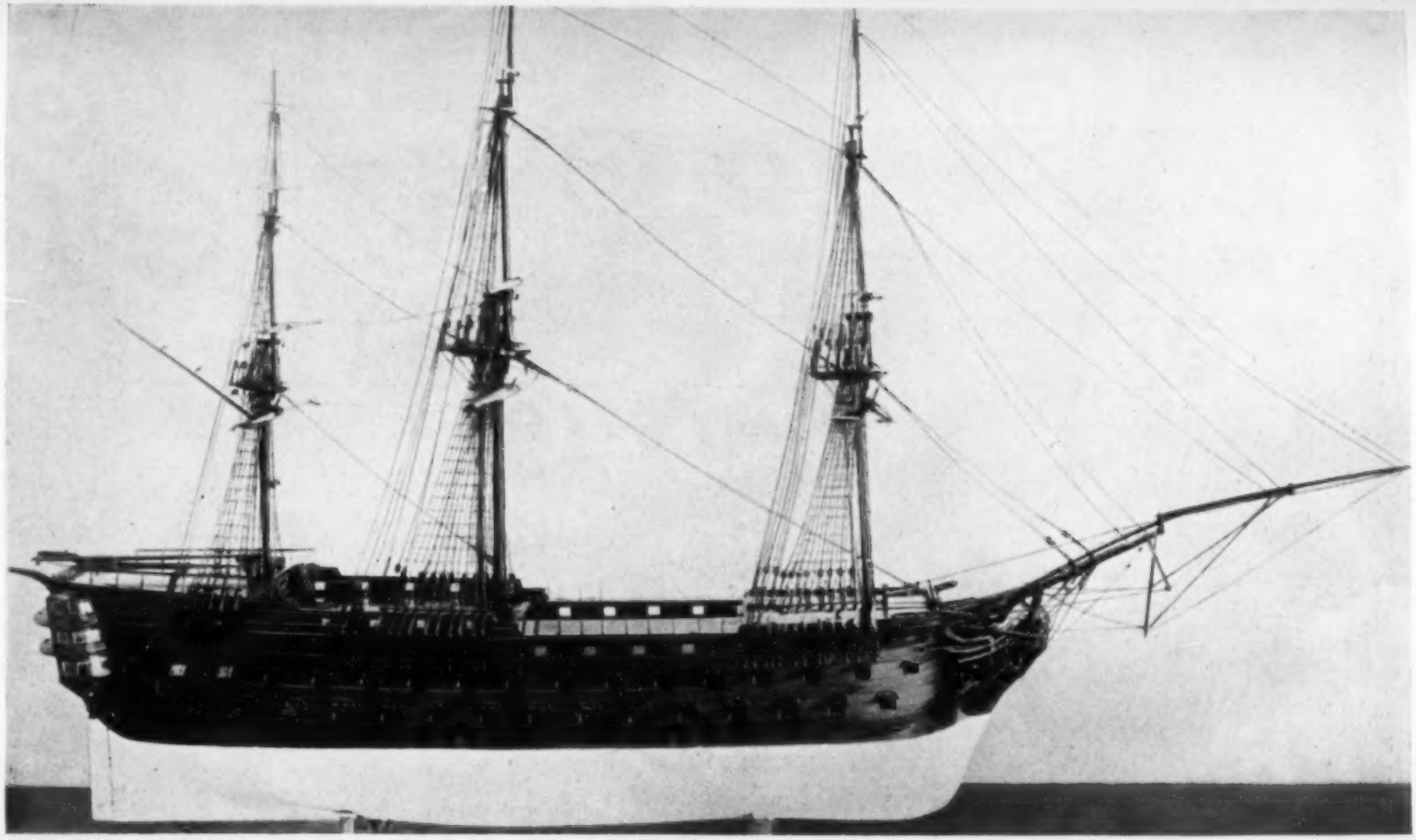


Courtesy U. S. Naval Academy

FOUR OF THE FIVE MODELS PRESENTED TO THE NAVAL ACADEMY IN 1854 BY ALEXANDER VATTEMARE

Left to right: The *Berceau,* French sloop of war captured by U.S.S. *Boston,* October 12, 1800; a French ship of the line called the *Aristide;* an East Indiaman; and the French frigate *Junon,* which took part in the battle of the Nile where Lord Nelson defeated Brueys, August 1, 1798.

and the French frigate *Junon*, which took part in the battle of the Nile where Lord Nelson defeated Brueys, August 1, 1798.



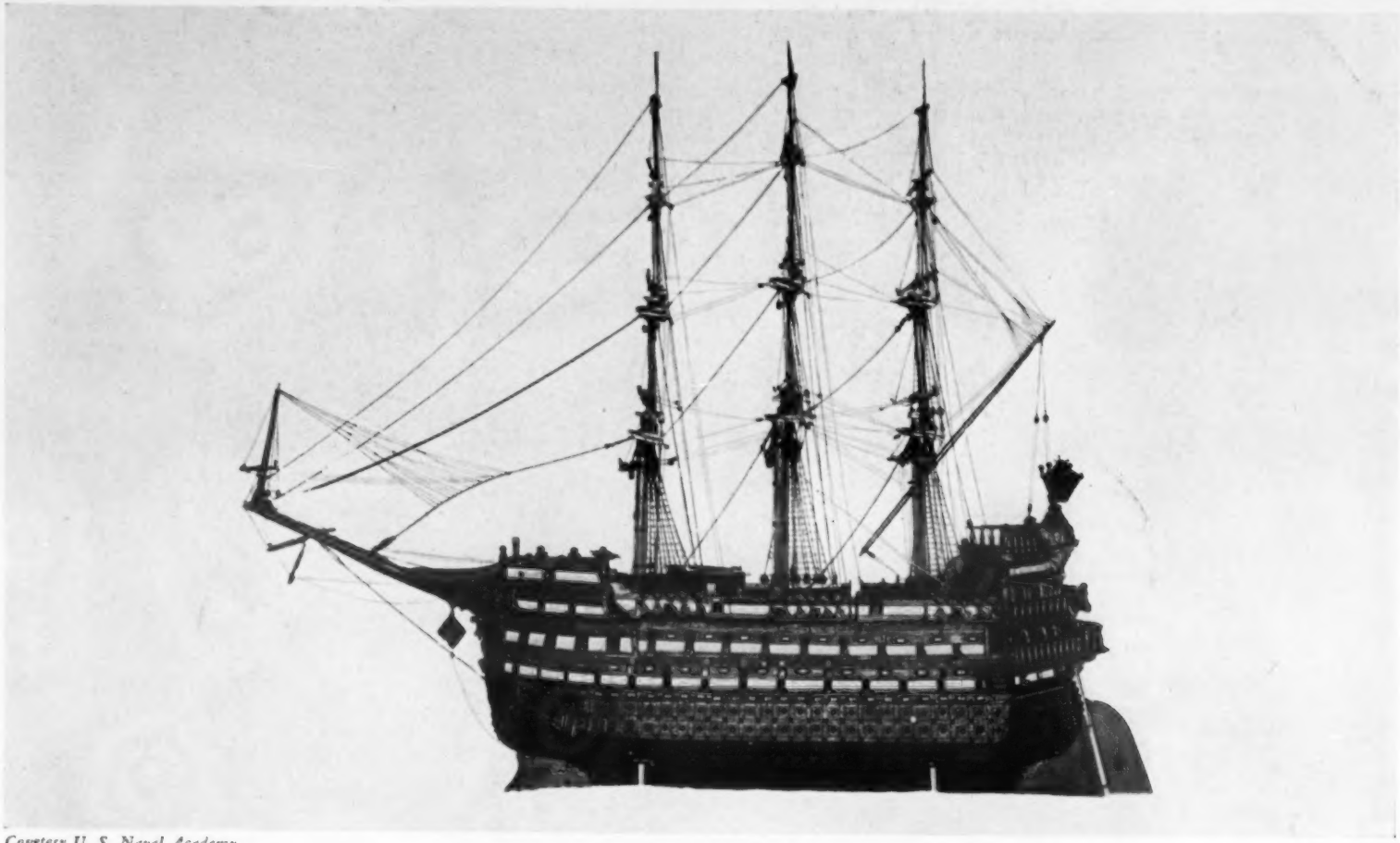
Courtesy U. S. Naval Academy

MODEL OF THE FRENCH SHIP OF THE LINE *VILLE DE PARIS*

The original, presented by the citizens of Paris to Louis XV, was the flagship of De Grasse at Yorktown, and was captured at the Battle of the Saints, April 9, 1782. On her decks in 1810, Admiral Collingwood, second in command at Trafalgar, died.

This fine model was one of five presented to the Naval Academy in 1854 by Alexander Vattemare.

UNIV. OF MICH.



Courtesy U. S. Naval Academy

A GENOESE BATTLESHIP, KNOWN AS THE *DANTE*, 1657

Note the decorative stern of the warship of this period. This was probably the model purchased for $80 by Captain George S. Blake, superintendent of the Naval Academy. For many years it has been wrongly listed as one of the Vattemare collection.

The Long Cruise *of a* Squadron *of* Naval Academy Ship Models

By HERMAN F. KRAFFT, *Curator, U. S. Naval Academy*

THE Naval Academy owns a ship model whose 120 miniature guns gave an actual salute to the Russian Czar, Alexander I, just before the latter's defeat by Napoleon in 1813. This model is one of five presented to the early Naval Academy. These five miniature ships a century ago went through land campaigns as disastrous for them as the sea fights in which some of their originals took part. These facts we gather from the following letter of the donor, Alexander Vattemare, written in 1854 to the then Secretary of the Navy, James C. Dobbin.

PARIS, May 8, 1854

Hon. James C. Dobbin,
Secretary of the Navy.

DEAR SIR:

I had yesterday a visit from Lt. Bartlett of the Navy, who came to take possession of the models of ships destined to the U. S. Naval Academy at Annapolis. The collection is composed of five models, viz:

The *Ville de Paris*.....of 120 guns
The *Aristide* .....of 74 guns
The *Junon* .....of 44 guns
The *Bericau* .....of 16 guns
A ship of the East India Company

A few words by way of description and history of the collection will not perhaps be deemed out of place here.

The models are [of] highly finished execution on a scale of two and one-half lines to one foot. They were built by Mr. Piedaniel, a distinguished engineer of the seaport town of St. Malo. Their construction was commenced by order of Louis XVI, but not being terminated at the time of the death of that unfortunate monarch, the ships remained upon the hands of the builder, who himself afterwards died from grief and disappointment. Subsequently, in 1810, a gentleman of St. Malo purchased the collection for the sum of 32,000 francs, hoping that he would be able to dispose of it advantageously to the Emperor Napoleon. With this view the purchaser came to Paris with his prize, and finding that the Emperor had just left his capital for Dresden in Germany, he immediately followed in pursuit, taking his little fleet along with him. Soon after his arrival in Dresden, the events of the war obliged the French to evacuate the city, which was taken possession of by the Russians. The collection was then offered to Emperor Alexander, who visited it personally, and ordered a professional report as to its value to be made to him by several Russian and English naval officers who happened to be in the city at that time. The report was favorable, and in consequence of it, the sum of 100,000 francs was offered for the collection in behalf of the Emperor. This offer was declined, the owner having fixed its price at 125,000 francs. Some considerable time was spent in negotiations which finally resulted (so desirous was the Emperor Alexander to possess these models of ships) in the acceptance of the owner's terms. Alexander promised to pay the sum required upon the delivery of the collection.

Meanwhile, the French in their turn, forced the Russians to retire; upon their retreat a party of Cossacks were charged to transport the boxes containing the collection to the opposite side of the river. The bridge over which the Russians had just crossed was blown up by the retreating army. Thereupon the Cossacks immediately abandoned their charge, seeking safety in flight. They threw themselves into the river which they crossed by swimming and rejoined their army. Thus the owner remained in possession of his collection, which amid the rapid and eventful political changes which followed, he was unable to dispose of. His pecuniary resources entirely exhausted, this gentleman now found himself destitute, and in a foreign land amongst people who, by genius and habits, were incapable of duly appreciating the beautiful and valuable collection of maritime objects of which he was the possessor. Such was the condition in which in 1814, being myself a prisoner of war at Berlin, I found that respectable gentleman with his family, a wife and two children. It was then, and in order to effect the relief of that excellent but unfortunate family, that I became an artist under the name of Alexander the Ventriloquist. My efforts were successful. I enabled them in 1826 to return to France with the collection of model ships which still remained in their possession. Subsequently, upon the death of the owner of the ships they became my property, I having married his daughter.

But having no suitable room in which to place them, and being moreover almost constantly absent from home, I obtained permission from the Minister of the Navy in 1827 to place them in the

Note the decorative stern of the warship of this period. This was probably the model purchased for $80 by Captain George S. Blake, superintendent of the Naval Academy. For many years it has been wrongly listed as one of the Vattemare collection.

building of the Navy Department, and there they have remained from that time to this, carelessly tossed from one room to another, frequently removed from one story to another, from attics to garrets, suffering immensely in the course of these changes from neglect, rough usage and plundering, till they now appear the mere wrecks of what they were, most of the cannons and much of the rigging have disappeared. These models were originally complete with all the appurtenances of ships of war in the minutest particulars of rigging, equipment and armament. When the Emperor Alexander visited the collection at Dresden, he was saluted with 120 guns fired from the *Ville de Paris*.

On my first visit to the United States in 1839, I happened to speak of this collection to the Honorable John Quincy Adams, and when I told him that among these vessels was the *Ville de Paris* he exclaimed—"but this man-of-war, commanded by Count de Grasse, was lost in coming to our assistance; how I should like to see that model, for I saw the original and went on board of her!" I asked Mr. Adams if he thought the presentation of it would be acceptable by the United States. He said it would by all means, and not only so, but that he would propose to have it placed in the center of the Congress Library as a memento of French sympathy for America, with an inscription upon it recalling the circumstances connected with the loss of that man-of-war in 1782.

From that time I determined to surrender the whole fleet to the United States as an humble testimonial of my respect and devotion towards your glorious country. Immediately upon my return to France in 1841, I made application to the French Government to have the whole put in good order. My request was granted for the *Ville de Paris* only, and I was requested to send her to the Louvre for that purpose. Mr. Le Bas, one of our most celebrated engineers, the same that erected the obelisk of Louxor, was ordered to superintend the repairs, and although he declared it would cost about 2,500 francs at least, it was nevertheless to be repaired. The moment I was informed of this favorable disposition, I invited the Honorable General [Lewis] Cass, then American Minister to France, to go and see the dilapidated state in which the model was that he might have an idea of the extent of the kind feelings of the Government towards the United States.

Meanwhile I made my second visit to America, during which political events brought on such important changes, and although the feelings of France for America are as strong as ever and perhaps stronger, yet I did not renew my application to this Government, fearing that the present circumstances are not favorable for obtaining a favor which, at any other time, would have been readily granted.

I must therefore beg of you, Dear Sir, to accept our fleet in the state it is, looking exactly as if it had just issued from a terrible conflict, with my regret that it is so unworthy of its high destination; apologizing at the same time for having entered into such long details about so little an affair. But as this collection may be considered, in some sort, as the original cause of that career as artist, which has enabled me to become the humble but devoted Advocate and missionary of the system of exchange, the precursor of a great intellectual union of Nations, I thought that these circumstances might be of some interest to one who has showed himself so friendly and so resolute a supporter of my laborious efforts to obtain this noble end.

I remain, Dear Sir,
Your very humble and devoted
Servant
ALEXANDER VATTEMARE

These five beautiful models have been at the Naval Academy now for three-quarters of a century. Unfortunately all except the *Ville de Paris* have for years borne names at the Academy different from those in the donor's letter. Unfortunately also, the donor—in at least two cases, the *Aristide* and the *Berieau*—names ships which according to Captain Chack, Chief of the Historical Division of the French Ministry of Marine, never existed in the French Navy. Of the five models, the *Ville de Paris* is of course the best known to fame. This French ship of the line was built by the citizens of Paris as a gift to Louis XV. At her launching she was the last word in naval construction. In the Battle of Saints' Passage in the West Indies, April 12, 1782, she was the flagship of Admiral de Grasse, who had brought such timely aid to Washington in the Yorktown campaign the year before. In this "Battle of the Saints" the *Ville de Paris*, surrounded by enemy ships and after a heroic defense lasting five hours, surrendered to Admiral Rodney. De Grasse was one of the only three unwounded men on her decks. On board the *Ville de Paris*, which was later taken into the British service, Admiral Colingwood died five years after his great part in the Battle of Trafalgar.

Besides the *Ville de Paris*, the other four models, as named by Vattemare, are: the *Aristide*, 74 guns; the *Junon*, 44 guns; the *Berieau*, 16 guns; and an East Indiaman. These four models at the Naval Academy are readily identified because in numerous details of workmanship they are similar to each other and to the *Ville de Paris* model. It is evident from Vattemare's letters that he was not strong on history. The labels on the old dilapidated models left him by his father-in-law were probably gone, and he rechristened them somewhat by guesswork. Captain Chack, in a recent letter to the writer, stated that there was no such French warship as the *Aristide*, and that the word *Berieau* has no meaning and probably re-

ferred to the well-known French sloop of war *Berceau.* The so-called *Aristide* has for many years been carried on the records simply as a French ship of the line, which she plainly is. The 44-gun frigate *Junon* has, after much repainting, been misnamed the *Didon,* but still bears the date 1797 on her stern. This date helps to identify her as the *Junon,* which in that year joined Admiral Brueys, played a minor part the next year in the Battle of the Nile, and was captured by the British, June 18, 1799. The *Berceau,* if such she is, represents the French sloop of war captured by the United States frigate *Boston,* October 12, 1800. Therefore two of the four smaller models probably are miniatures of French cruisers well known in their day for their losing fights against American and British antagonists.

The Naval Academy owns another remarkable ship model, the *Dante,* 1657, which has for many years been confused with the Vattemare collection. But the *Dante* is utterly different from them in workmanship. Moreover, she plainly belongs to the warship era of a previous century, as is proved by the lateen sail on her mizzen, the great quantity of elaborate decoration on her bow and stern, and the "gingerbread" work on her hull. According to an old letter in the superintendent's files, the *Dante* was probably the Genoese model which was bought for a song at the instance of Captain Blake in 1860. Besides, as Captain Chack wrote some years ago, France had no *Dante* among her warships of the seventeenth century design. The outbreak of the ironclad era of the Civil War, just when Captain Blake acquired the Genoese model, fixed the attention of the Naval Academy and of the nation for many subsequent years on other matters than ship models of ancient European windjammers. It is therefore quite natural that the *Dante* and Vattemare's miniature ships quickly became lost in legendary history. In keeping with legendary history also is the name *Dante,* for a search of the Italian Navy's records reveal no such ship. *Dante* was probably as good a name as any for a ship of the great days of Genoese sea power.

The donor of these five models seems to have been unknown to fame. He calls himself an artist, but no clue to his life or work appears in any contemporary record or elsewhere. In the archives of the Naval Academy Museum there is a letter in Vattemare's hand, dated December 24, 1849, in which he presents to the Naval Lyceum at the Brooklyn Navy Yard some books by French authors on nautical science, naval history, etc. These works, he says, "were entrusted to my care by France for presentation to the United States." It will be recalled that at this time France was in the throes of the Revolution of '48, which ended by making Napoleon III Emperor. While, therefore, Vattemare left no mark as an artist, his gift illustrated not only his own generous spirit but was evidently intended as a good will offering for his country. And if M. Vattemare is remembered for his gift, M. Piedaniel, the maker of the models, has also a claim on our admiration, for as a ship modeler he was an artist. As said before, the models are products of remarkable workmanship. To take but one little detail, the scraping off of many layers of paint and varnish brings to light innumerable tiny brass hinges on gun ports and hatches, which were wrought with infinite patience and skill. Unfortunately, much of the original rigging and equipment was lost, probably before this little fleet of many cruises ever reached its final anchorage at the Naval Academy. Of the 120 guns that saluted Alexander I, not one is left. Napoleon's careless interruption prevented the Czar's buying the ships for 125,000 francs. At a conservative guess they are worth as many dollars today.

The Battle *at* Blanc Mont

(*October 2 to October 10, 1918*)

By Lieutenant Colonel Ernst Otto, *German Army (Retired)*
Translated from the German by Martin Lichtenberg, *U. S. Marine Corps,* Army War College

(Continued from the March issue)

The Ninth Day of October

(See Map X.)

THE commanding general of the American 2d Division, Major General Lejeune, on the morning of October 9 issued the following order to the commanding general of the American 71st Brigade, General Pegram-Whitworth:

The combat lines of the 71st Infantry Brigade will be smoothed out, the troops echeloned in depth. Attempts will be made to feel out the enemy, and contact will be kept up with the neighboring divisions. There will also be a reconnaissance of the trench system located eight hundred meters north of St. Etienne. These trenches, if unoccupied by the enemy, will be occupied by our own troops, otherwise they will be attacked at 11:00 A.M.

Supplementary orders were to the effect that General Whitworth was to prepare for taking over the entire sector of the American 2d Division, which was scheduled to be withdrawn during the night of October 9 to 10.

But the 71st Brigade was in no wise able to launch an attack on the ninth. All of its troops were employed in one single line. The regiments themselves were not indeed mixed up, but within each regiment there was much intermingling of battalions and companies, as a result of the miscarried "leap-frog" operation. A whole day was necessary to bring the troops into a united organization. Mixed units were withdrawn and then used to fill the gaps in the lines. In the case of the 142d Infantry Regiment, one mixed battalion with one platoon of machine guns and one platoon of trench mortars was formed. This battalion was designated to fill the gap between the two regiments (141st and 142d), it being erroneously supposed that the 142d was located somewhat in rear of the 141st. This battalion at about 12:30 P.M. attempted to advance in the direction of St. Etienne but barely succeeded in getting across the slope of Blodnitz Hill, where it entrenched after having advanced only some 150 meters.

At the right, the extreme flank of the 141st Infantry connected with the attack of the French 346th Division. Here was still located the 2d Battalion, 2d Engineers, maintaining contact with the French division. On the left, the French 7th Infantry Division again attacked and requested that the American 2d maintain contact with it. Thereupon the 1st Battalion, 6th Marines, and the 1st Battalion, 2d Engineers, employing two companies each, advanced and occupied the trenches seven hundred meters north of St. Etienne.

In this position they were relieved by the mixed battalion, now called the 3d Battalion, 142d, which, at about 11:00 P.M., had returned to Blodnitz Hill and then during the same night had moved to St. Etienne.

Meanwhile, the commander in chief of the French 4th Army had placed at the disposal of the French 21st Army Corps the remainder of the American 36th Division. General Naulin ordered that the latter relieve the American 2d Division during the night of October 9 to 10, the change of command taking place at 10:00 A.M., the following day.

The German authorities summarized these events in the following report of Army Headquarters, 3d Army:

After their serious defeat on October 8, the

MAP "X"
SITUATION ON THE FORENOON OF
October 9th 1918.
213TH Inf. Div.
17TH Inf. Div.
203RD Inf. Div.
199TH Inf. Div.
242ND Inf. Div
RECONNOITERED POSITION
SEMIDE
Machault
COUROY
ARNES
Brook
ST. CLEMENT
ST. PIERRE
SENTRIES
COMBAT ZONE OF THE
2ND AMERICAN DIVISION
SCETIENNE
Blockhouse Hill
Orfeuil
Pioneer Co's
375 376
57TH INF. REGT.
475TH Inf. Regt.
476TH Inf. Regt.
127TH Inf. Regt.
8TH Jager Regt.
147TH Jager Regt.
74TH Res. Inf. Regt.
368 Inf. Regt.
38TH Inf. Regt.
75TH Inf. Regt.
90TH Inf. Regt.
SHARPSHOOTER DETACHMENT

enemy today made no efforts to continue the major offensive which they have thus far carried on with powerful masses of men and material. Their activities were limited to local raids which only served to increase their losses without bringing the slightest results.

The hostile artillery fire, weak throughout the forenoon, attained a somewhat heavier volume at noon in the sector of the 18th Infantry Division as the weather, and with it visibility, improved. In the sector of the 213th Division it even attained proportions of a bombardment. Two local attacks of the enemy, launched along both sides of St. Etienne and from Blodnitz Hill after a one-hour lively artillery preparatory fire, collapsed with heavy losses. Fighting for every foot of ground, our covering parties gradually retreated across the Aisne before the enemy, who sharply pressed them in the Aisne bend between Vaux les Mouron and Lançon and forced them back as far as the hills just northwest of Grand Ham. Hostile troop concentrations near Montcheutin were broken up by our concentrated annihilating fire, and an attempt to cross the Aisne near Mouron was prevented. On the left flank of the 76th Reserve Division, the enemy pursuit was very slow. Upon the approach of evening, hostile reconnaissance detachments advanced along both sides of the Sommepy-Attigny road, supported by lively artillery fire, but were repulsed. In contrast to methods pursued during previous defensive battles, Army Headquarters during this last great defensive adhered strictly to the principle that, faced as we were by a far superior enemy, the defense must be at all times an elastic one. Bound by no orders from above, it was possible to prosecute any initiative that gave promise of a successful defense. Herein lies the chief significance of this last major combat. It was shown that even seriously depleted troops, when employed in this type of defensive warfare, may still carry on, gain increased confidence, and thus daily strengthened in purpose, give their best and utmost.

At the beginning of this report we were shown that the 3d Army, in connection with the operations of the 5th Army during the night of October 8 to 9, withdrew its left flank behind the Aisne. On October 9, Army Headquarters issued orders for occupation of the Brunhild Position. This movement was scheduled to begin during the night of October 9 to 10, continue during the following night (10 to 11), and be completed during the night of October 11 to 12. (See Maps A and Z). All other details incident to the withdrawal of the front were minutely arranged.

But the losses of the German divisions had attained serious proportions. Therefore the 213th Infantry Division ordered that each regiment was to be reduced to two battalions with three companies each, one machine-gun company, and one trench mortar platoon.

At 3:50 P.M. Group Py ordered:

Tonight the main line of resistance will be withdrawn to a line (right flank as far as the map square) extending as follows: boundary of Map Square 1048–north edge of Scay depression–Scay Ferme–south slope of Victoria Hill–Mont Chery. Terrain located in front thereof will be garrisoned with outpost sentries. Conduct of these sentries: lively light signal flares and rifle and machine-gun activities.

The artillery will be located north of line Cauroy–Machault–Kamenzer Rücken–Magazin Mulde–Daims Bach. In front thereof will be located only tank-defense batteries and several combat batteries.

This new main line of resistance will be held. Hour of withdrawal into this line will be made known later. Make all necessary preparations.

This proves that during the night of October 9 to 10, only the left flank of the 213th Infantry Division was withdrawn.

There was only one report concerning combat engagements, and that was submitted by the 14th Jäger Regiment:

The position now occupied will be held. The elements of the infantry and of the 4th and 16th Jäger Battalions which, during the counterattack, were absorbed in the lines of the regiment, will be withdrawn. The 22d Jäger Battalion will expand its sector to the left as far as the mouth of the Arnes; the 15th Jäger Battalion will take over the protection of the St. Etienne–Machault road. At 10:00 A.M. the enemy again attacked in the direction of St. Etienne and Blodnitz Hill. The attack was repulsed.

But in the sector of the 242d Infantry Division the contemplated counterattack was carried out, and concerning it the following report was submitted (See Map W):

After a brief but severe artillery preparatory fire, the 3d Battalion, 127th, the 3d Battalion, 16th, and 1st and 2d Battalions, 56th, the 475th Infantry Regiments, together with the 2d Reserve Jäger Battalion, launched a counterattack in order to recapture the old main line of resistance within the sector of the 476th Infantry Regiment. Almost immediately after the beginning of our own artillery bombardment, the enemy placed a heavy fire on our lines of departure which finally attained pro-

portions of a drumfire. Despite this, the troops on the right flank succeeded in advancing from 150 to 350 meters. On the eastern flank (as a result of lively counter activities of the enemy) the attack never even got under way.

The hostile artillery bombardment directed chiefly on our rear area continued in unrestricted volume until about 11:00 A.M. At 11:15 A.M. the enemy again attacked the entire sector of the 476th. The pressure of this attack was exerted chiefly against the northwest corner of the break in our lines, where the enemy succeeded in entering the positions of the 56th Infantry Regiment and the 9th Company, 476th. Immediately launched counterattacks forced the enemy withdrawal from our lines at every point.

After another intensive artillery preparation, the enemy at twelve o'clock noon again attacked the sectors of the 2d and 3d Battalions, 127th, as well as the sectors of the 3d Battalion, 16th, and 2d Battalion, 56th. At every point the enemy was completely repulsed. No further major attacks were made on this day.

In this division also, the withdrawal of the front was to be delayed until the night of October 10 to 11.

The Tenth Day of October
(See Appendix I and Map Y)

Together with headquarters of the American 72d Infantry Brigade, the staff of the American 36th Infantry Division was located in the vicinity of Suippes-Souain, when it received its orders to move to the front. On October 9, the troops arrived in the vicinity of the Navarine Ferme and late in the evening were shown into their billets by guides. With its 2d and 3d Battalions, the 143d relieved the 23d Infantry of the 2d Division, which at that time was located at a point two kilometers southeast of St. Etienne and west of the St. Etienne–Sommepy road. The 1st Battalion, 143d, occupied a position near the road crossing. The 1st Battalion, 144th, relieved the 1st Battalion, 6th Marines; the 2d and 3d Battalions, 144th, relieved the 5th Marines immediately north of Blanc Mont. The 2d Field Artillery Brigade, the 2d Engineers and several ammunition and medical trains of the 2d Division remained in the position, and also the machine-gun companies, the latter for a period of twenty-four hours only. The four companies of the 133d Machine-Gun Battalion of the 36th Infantry Division were distributed between the 143d and 144th Infantry Regiments.

At 3:30 A.M. the relief was completed. The new troops complained that they had received but little useful information from the relieved troops concerning the general combat situation.

A corps order of General Naulin of the French 21st Army Corps gave instructions according to which the 36th Infantry Division, beginning at 10:30 A.M. of the same day, was to take possession of certain trenches located 1,200 meters north of St. Etienne. In view of the fact that the relief, at the time this order was received, was not yet completed, it appeared that the advance and capture of the trenches might have to be done by the 71st Brigade. General Pegram-Whitworth, however, was of the opinion that, since the mishap suffered on October 8, his troops had not sufficiently recovered to carry out an attack of such proportions. He therefore repaired to headquarters of the 2d Division and requested that this attack be omitted.

Later in the day various indications made it evident that the Germans had withdrawn; but in general only reconnaissance patrols were pushed forward. Late in the evening an attack was launched in compliance with orders of the French 21st Army Corps, but did not get very far.

With this last report we can terminate the review of the combat activities of the Americans, for at 11:00 A.M., Major General Lejeune transferred the command of the sector to the commanding general of the 36th Infantry Division, Major General Smith. However, Major General Lejeune and his chief of staff, Colonel Rhea, remained in their old command post for an additional period of twenty-four hours.

In order to somewhat enlarge upon the final situation on the German side, I will merely cite the order of the 213th Infantry Division, issued at 1:35 P.M., October 10. This division had been given uniform command over all rear guards that had remained in the former sectors of the 213th, 17th and 203d Infantry Divisions. This is the order (Map Z):

(1) The following units will remain behind as rear guards: Regiment Riesenthal in sector St. Etienne; 74th Reserve Infantry Regiment in sector Machault; 75th Infantry Regiment in sector Médéah; 2d Bavarian Infantry Regiment in sector Orfeuil.

(2) Beginning midnight, October 11, these rear-guard regiments will be under the com-

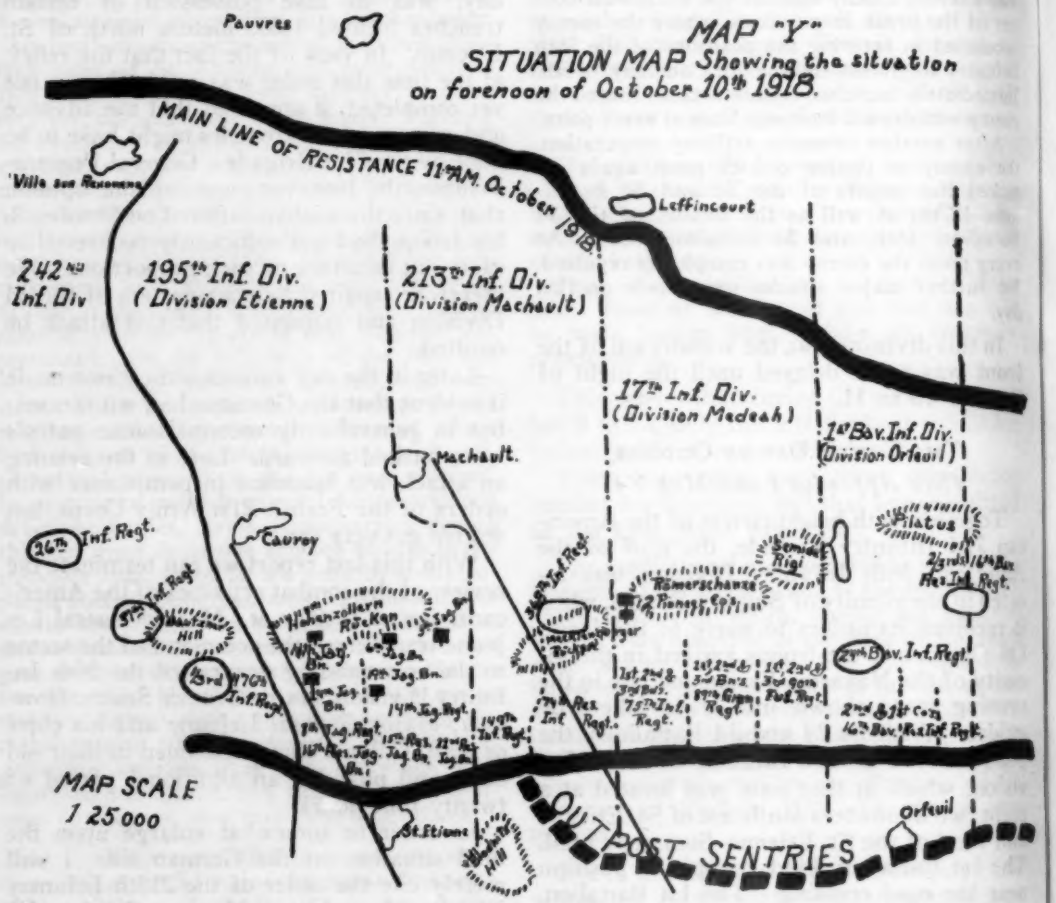
mand of the 213th Infantry Division, with headquarters in Pauvres. After reaching the intermediate position northwest of Mont St. Remy–Dricourt–Contreuve, they will all revert back to their former divisions. Closest contact to the rear with the 213th Division, as well as the neighboring regiments, is at all times required in order to prevent portions of the rear guard from being cut off. For this purpose, each infantry regiment will assign one mounted officer with mounted messengers to headquarters of each neighboring infantry regiment. In addition to that, each regiment will be assigned the use of a certain wireless station which, beginning at twelve o'clock midnight each night, will engage only in such wireless traffic as is required between the regiment to which it is assigned and the divisional wireless station in Pauvres.

(3) The artillery rear-guard detachments are under the command of the regimental commanders of the infantry regiments, who will be also held responsible for their timely withdrawal.

(4) Each rear-guard unit will report at once, by any and all means available, on the following points:

(a) The hour when the present main line of resistance is evacuated.

(b) The hour when the Hohenzollern Rücken–Römerschanze–Semide–Pilatus line is evacuated.



(c) The time when Cauroy, or Machault, as the case may be, is passed by the regiments of the 196th and 213th Infantry Divisions.

(d) The time when each of the four regiments reaches the intermediate position northwest of Mont St. Remy–Dricourt–Contreuve.

Identical reports will be submitted simultaneously to the neighboring regiments through the liaison officers.

The withdrawal will take place immediately upon receipt of orders from the division, and will be carried out along the entire front.

If, by reasons of a surprise attack by the enemy, any regiment has been forced to withdraw earlier from abreast the lines of the others, the commanding officer will be held responsible for immediate transmission of information to that effect to the neighboring units. In the Hohenzollern Rücken–Mecklenburg Rücken–Romerschanze–Pilatus line the troops will be held concentrated under all circumstances in order to form a new front. The locations of the regimental command posts there will be reported at once.

The events of October 10, as they developed on the German side, are summarized by Corps Headquarters, 12th Army Corps, Group Py, in the following report:

During the night the enemy continued artillery activities of varying strength. Village and railway terminal of Machault and Semide-Machault highway were shelled. The scheduled movements were carried out as planned.

In the sectors of the 17th Infantry and the 1st Bavarian Infantry Divisions, the enemy followed at first hesitatingly, but in the afternoon with larger forces. Strong reconnaissance detachments which, during the afternoon, advanced against our front, suffered heavy casualties in our machine-gun fire. At 5:00 P.M. a strong attack, launched against Victoria Hill with several attack waves, was repulsed. A similar attack near St. Etienne suffered the same fate. Hostile troop concentrations and marching columns were effectively subjected to the annihilating fire of our artillery.

After a heavy artillery bombardment, the enemy opposing the left flank of Group Langer launched an attack against the sector of the 2d Reserve Jäger Battalion which was repulsed.

The defensive campaign in the Champagne and on the Meuse had begun on September 26; it ended on October 11.

Three days before the latter date, His Majesty the Kaiser directed the following telegram to General-Oberst von Einem, the commander in chief of the German 3d Army:

My dear General von Einem:

Thoughout the entire war, and especially during these recent critical combats of the 3d Army, you have, with definite purpose, and with iron energy, constantly spurred on your brave troops to their utmost efforts, in order to prevent a break through our lines and to make the enemy pay dearly for every foot of ground gained. The achievements of your officers and men are beyond all praise. May I express to you my own and sincere thanks of the Fatherland, and as visible evidence of the appreciation of your services, I elevate you herewith to the rank of Honorary Regimental Commander of the battle-seasoned 16th Westphalian Infantry Regiment, formerly named Count von Sparr, leaving you at the same time still in honorary command of the 4th Cuirassier Regiment. To your trustworthy and untiring chief of staff, Lieutenant Colonel von Klewitz, I have presented my portrait.

Signed: WILHELM R.

General von Einem, in informing his troops of this decoration, spoke as follows:

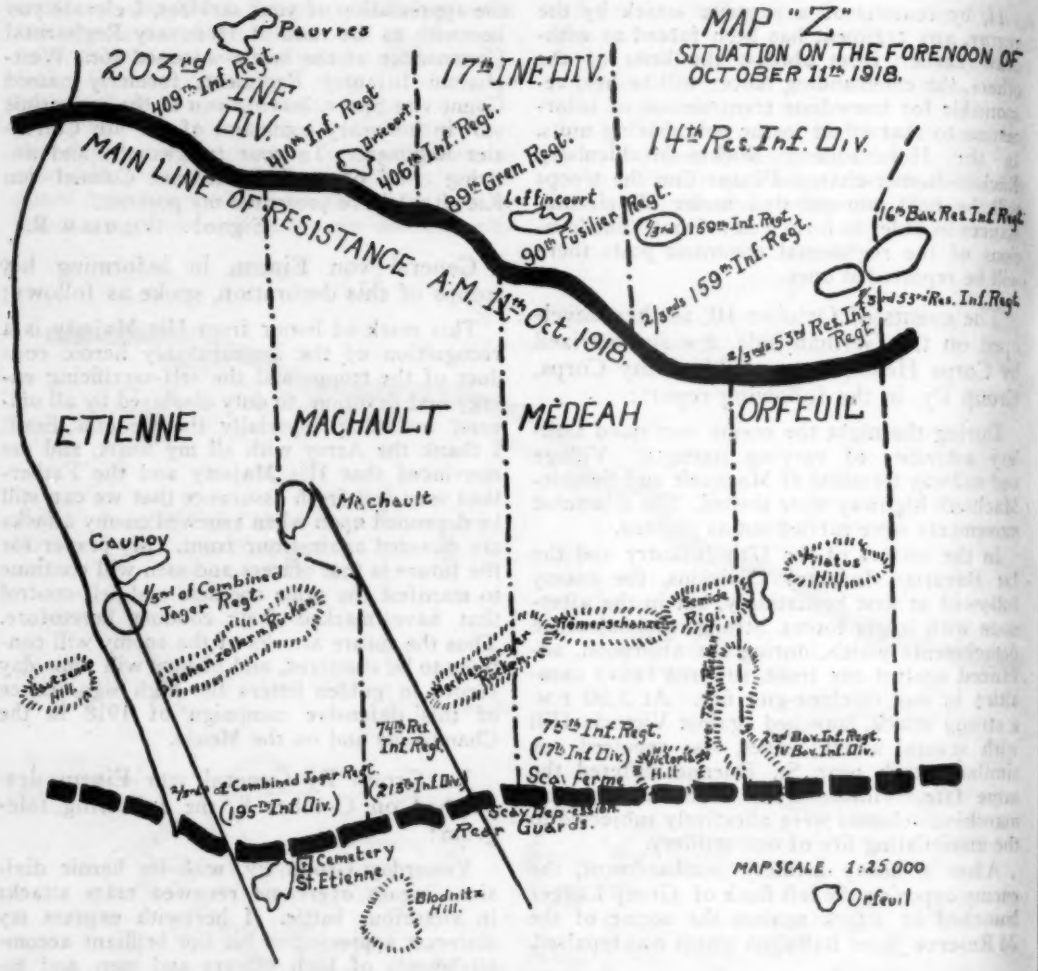
This mark of honor from His Majesty is a recognition of the incomparably heroic conduct of the troops and the self-sacrificing energy and devotion to duty displayed by all officers, including especially the General Staff. I thank the Army with all my heart, and am convinced that His Majesty and the Fatherland may feel fresh assurance that we can still be depended upon when renewed enemy attacks are directed against our front. My prayer for the future is that officers and men will continue to manifest the same coolness and self-control that have marked their conduct heretofore. Thus the future attacks of the enemy will continue to be shattered, and history will some day record in golden letters the high significance of this defensive campaign of 1918 in the Champagne and on the Meuse.

To Group Py General von Einem despatched on October 8, the following telegram:

Yesterday Group Py, with its heroic divisions, again overcame renewed mass attacks in victorious battle. I herewith express my sincerest appreciation for the brilliant accomplishments of both officers and men, and especially those of the 2d and 24th Reserve Jäger Battalions, the 89th Grenadier Regiment, the 149th, 368th, 406th, 409th, and 74th Reserve Infantry Regiments, the 6th Company, 2d Bavarian Infantry Regiment under the command of Lieutenant Möller, and very particularly to Lieutenant Staak and Acting Officer Luedtke of the 75th Infantry Regiment and Lieutenant Range of the 89th Grenadier Regiment.

But, on October 13, the German Crown Prince, as commander in chief of the Group of Armies under his name, despatched the following wireless message to Headquarters of the 3d Army:

The hard-fought defensive battle in the Champagne has come to an end. With a powerful employment of men and material, the enemy has sought to overrun the thin German lines. In the face of the heroic resistance of-



fered by the German 3d Army, these offensives have been shattered with terrible losses to the enemy. The general situation makes it imperative to remove the armies into shorter lines further in the rear. Your military reputation is in no wise altered thereby. You have, as ever, done your duty. You have seen that no enemy can be powerful enough to force you to your knees. If the enemy still dares to continue his offensives, we are ready to protect hearth and home, even to the last man. This I know, and expect in the future, from the unconquered 3d Army.

Signed: Wilhelm, *Crown Prince.*
The Commander in Chief

Justified indeed is the pride of the German troops who participated in these combats, but justified also is the pride of the American 2d Division.

True, there was a great difference. The American troops were fresh and up to full combat strengths. I am not familiar with the exact strength of the American 2d Division, but I know that the 36th Infantry Division numbered 656 officers and 15,590 enlisted men. The majority of the German divisions had been engaged in combat since September 26, the beginning of the great drive. They were worn out and much reduced in numbers; as we have seen, the German infantry regiments towards the end had the rifle strength of only an average American company. It is true that "fresh" German troops were brought up, but these were not really fresh; they had had no rest or training periods, but were merely shifted from quieter parts of the front. While, as we have seen, the French 22d Infantry Division was employed in lines during the night of October 3 to 4, and was relieved four days later on the night of October 7-8, the Ger-

man divisions remained employed in lines until the last ounce of physical strength had been pounded out of them. They were at once transferred to some other front, where without a rest their fighting was renewed.

It was precisely this lack of rest that wore out the German Army, when, upon the employment at the front of numerous American divisions, the war got "beyond our power." But this does not detract from the renown of the American 2d Division; its advance of October 3 was magnificent.

When reviewing the attack of this division against the Bois de Belleau which took place on June 6, 1918 (PROCEEDINGS, vol. 54, November '28, page 946), I found it necessary to criticize the attack order issued by the French corps commander, General Degoutte. The corps order of General Naulin concerning the employment of the 2d Division on October 3 is admirable. The vice-like grip brought about in the advance of two separately attacking divisions (see Map G showing hills and ravines) was bound to be extraordinarily effective, especially as the American 3d Brigade took the German positions on the hills in the flank and was able to continue a successful advance through the ravines. The method of avoiding a certain portion of terrain, leaving it unattacked in the beginning of the offensive, is one that was repeatedly utilized by the Germans during their major combats, and was much liked by the higher officers and much disliked by the troops. Officers experienced in front-line command know the difficulty that lies in accomplishing an attack mission when hostile machine guns, located in the flanks, are being disregarded and left for later attacks by other troops. They are apt to bring the entire offensive to an untimely end. To eliminate them with gas or artificial fog is not so simple. No one knows exactly where they are located, and in this case the gassing of a triangular terrain with a front two kilometers long was, of course, out of the question. Only those who have witnessed combats of this type know their difficulties, and can thus fully appreciate the excellent execution of this attack by the American 2d Division. An especially difficult problem was faced by the 3d Brigade, which had to put its troops into their lines of departure during darkness, on an unknown terrain, in close proximity to the hostile front. This is something entirely different from an ordinary relief at night on a terrain with which the troops are familiar. An operation of precisely this same nature was entrusted to me on June 29, 1918, when the Chemin des Dames offensive was in full swing (Battle at Soissons and Rheims), and in assigning it to me my division commander used these words: "You see yourself here confronted with a very difficult task but I know that I can depend on you and your regiment."

General Naulin may have used similar words when he gave General Lejeune his instructions for his 2d Division and General Ely for his 3d Brigade.

I shall never forget the moment when, advancing at the head of my regimental marching column, I suddenly heard a young lieutenant, who a few hours previously had asked road directions, exclaim: "We are wrong here. I have lost my way!" Now, the attack was to be launched within another half hour. It required coolness and presence of mind on the part of all concerned that night to occupy the line of departure before dawn. And we were soldiers with long years of war experience!

Since on October 3 the neighboring divisions on each flank made little progress, the American attack soon spent itself. To continue it in the wedge-like form into which it had worked itself was impossible. The German Higher Command correctly perceived the dangerous situation into which the American 2d Division had got itself, and immediately launched counterattacks against both flanks of the enemy who had entered its lines. These were carried out by excellent German battalions which thus far had seen little combat activities, but they were shattered nevertheless in the face of the stubborn resistance offered by Americans.

The American offensive was not only skillfully executed, but also favored by good luck. We have seen in the report of the 3d Battalion, 74th Reserve Infantry Regiment, that the two other battalions of this regiment were on October 2 still holding positions to right and left of the Sommepy–St. Etienne road, which was considered a reserve position, and were not moved to Médéah Hill until that night. This transfer created a broad gap through which the American attack could find its way, and this also gave the wedge-like thrust a still more pronounced aspect.

Now what judgment is to be passed on the failure of the attack on October 8, of the American 71st Infantry Brigade? The 36th Infantry Division, when brought to the front, had only just completed its period of intensive training in the camps behind the front, and, moreover, it had never been engaged in combat before. This attack of October 8, then, was simply a baptism of fire for troops who had as yet had no experience in warfare. The tremendous impression which the failure of this attack created on these inexperienced troops is psychologically easy to explain. When the German troops first entered the field we had the same experience with a number of our own regiments, which afterward fought courageously throughout the war.

Doubtless another contributing factor was the unrest and nervousness among the troops as a result of the delayed attack orders. Probably they had also been told that the Germans were at the end of their strength, so that the men, after going through the ordeal of attack and then encountering powerful counterattacks, felt their expectations completely betrayed. But the major share of the failure may be attributed to the tactical method of attack adopted, the so-called attack in "battalion-column." This step-by-step employment of the regiment, in which the front-line battalion occupied the entire length of the line of departure, the next following battalion was held in readiness as a second attack wave, and the last served in a like manner as a third attack wave, had of course the advantage, in connection with the previously mentioned "leap-frog advance," that within the front lines there remained always a reserve of fresh, still undepleted forces. It is even very probable that, during the successful advance of the Americans on October 3, this method proved advantageous. But it carried with it the danger that the rearward lines might crumble and weaken simply because a number of naturally timid men might become frightened and seek protection in the lines of the battalion which had temporarily come to a halt. In the attack of October 8, when the front lines saw their advance checked by the Germans, it brought about a mixture of units, what is called in German a *schützenbrei,* or mixup of men of various organizations. Into such a *schützenbrei*—with all units in one line—the whole brigade was transformed within a very few hours. To carry on an offensive with such disorganized masses of troops is impossible; confronted with such an unusual situation, the men must necessarily have come to the conclusion that the things they had learned with so much difficulty and sweat on the parade grounds were all wrong. Therewith they lost all confidence in the value of their training, in their own physical capabilities, in the effectiveness of their weapons. Even on October 10, when the Germans had only very thin forces of infantry within their own lines, these men of the 36th Division dug in whenever the German artillery opened fire.

Such conditions would never have arisen had the battalions attacked abreast of one another, deeply echeloned within their own lines; in other words, had they followed the German, or even the French method of attack. This latter method enables the regimental commander to have his third battalion available at all times. But even in such cases a military unit may suffer a period of depression. It would be wrong to draw from the foregoing the conclusion that the troops of the American 36th Division had only a second-class value. If we had occasion here to review subsequent events in the war, we should no doubt see that, after having overcome their own period of depression, the 36th Infantry Division accomplished many a brilliant attack.

The distinguished achievements of the 2d Division are clearly recognized in the following situation report of the French Army:

> Up to October 4, at which date the present bulletin is written, the 4th Army has gained territory of the highest military value. A splendid American division, full of dash and ardor, the 2d Division, placed at the disposition of the 21st Corps on October 3d, made itself master of Massif Blanc Mont, which dominates the valley of the Suippes. This conquest rapidly brought about the downfall of Notre Dames des Champs (Helenen Hill) and the Grand Bois de Saint Souplet (Leipziger Hill).

Here is the report of the day issued by the French 21st Army Corps on October 6:

> Despite the enfilading fire of an enormous number of hostile machine guns, artillery, and even trench mortars, the American 2d Division was able to hold its position without loss of any part. This made it possible for the French 11th Corps to move its positions forward on October 5, as far as Arnes brook.

Between October 2 and 10, the American 2d Division suffered the loss of 209 officers,

of whom 41 were killed and 6 missing; and 4,771 men, 685 of whom were killed and 579 missing. It captured 48 officers and 1,915 enlisted men, 25 cannon, 332 machine guns, 20 trench mortars, 6 tank-defense guns and a great quantity of munitions and equipment.

As a token of appreciation on the part of his own country, the commanding general of the American 2d Division, Major General John A. Lejeune, was decorated with the distinguished service medal with the following citation:

He commanded the 2d Division in the successful operations at Thiaucourt, Massif Blanc Mont, St. Mihiel, and on the west bank of the Meuse. In the Argonne-Meuse offensive his division was directed with such sound military judgment that it broke and held by the vigor and rapidity of its attacks enemy lines which had hitherto been considered impregnable.

By his French allies he was decorated with the croix de guerre with palm leaf with this citation:

He commanded his division with great ability in the attack on Blanc Mont, October 3 to 7, 1918; seizing in a few hours a position of vital importance and capturing 1,800 prisoners and a large quantity of military material.

In addition to this, General Lejeune was also decorated with the cross of a commander of the Legion of Honor for his achievements in commanding the American 2d Division during the battle at Blanc Mont, October, 1918.

Thus the combats for the possession of Blanc Mont form a page of glory in the history of the German regiments who took part, and likewise a page of glory in the history of the American 2d Division.

APPENDIX I

French Group of Armies Maistre

Commander in Chief of the French 4th Army: General Gouraud
Commanding General, French 21st Corps: General Naulin

Order of Battle of the American 2d Infantry Division

Division Commander: Major General John A. Lejeune, U. S. Marine Corps
Chief of Staff: Colonel G. C. Rhea, G. S.
G-1: Lieutenant Colonel Hugh Matthews
G-2: Major R. S. Keyser
G-3: Colonel H. B. Meyers
3d Infantry Brigade: Brigadier General H. E. Ely
9th Infantry Regiment: Colonel G. W. Stuart
23d Infantry Regiment: Colonel E. R. Stone
5th Machine-Gun Battalion: Major H. T. Lewis
4th Infantry Brigade: Brigadier General W. C. Neville
5th Marine Regiment: Colonel Logan Feland
6th Marine Regiment: Colonel Harry Lee
6th Machine-Gun Battalion: Major L. W. T. Waller, Jr.
2d Field Artillery Brigade: Brigadier General A. J. Bowley
12th Field Artillery Regiment: Lieutenant Colonel J. A. Holabird
15th Field Artillery Regiment: Colonel J. R. Davis
17th Field Artillery Regiment: Lieutenant Colonel Sparks
4th (Div.) Machine-Gun Battalion: Major A. D. Bruce
1st Field Signal Battalion: Major Charles Murphy
2d Engineer Battalion: Colonel G. W. Mitchell

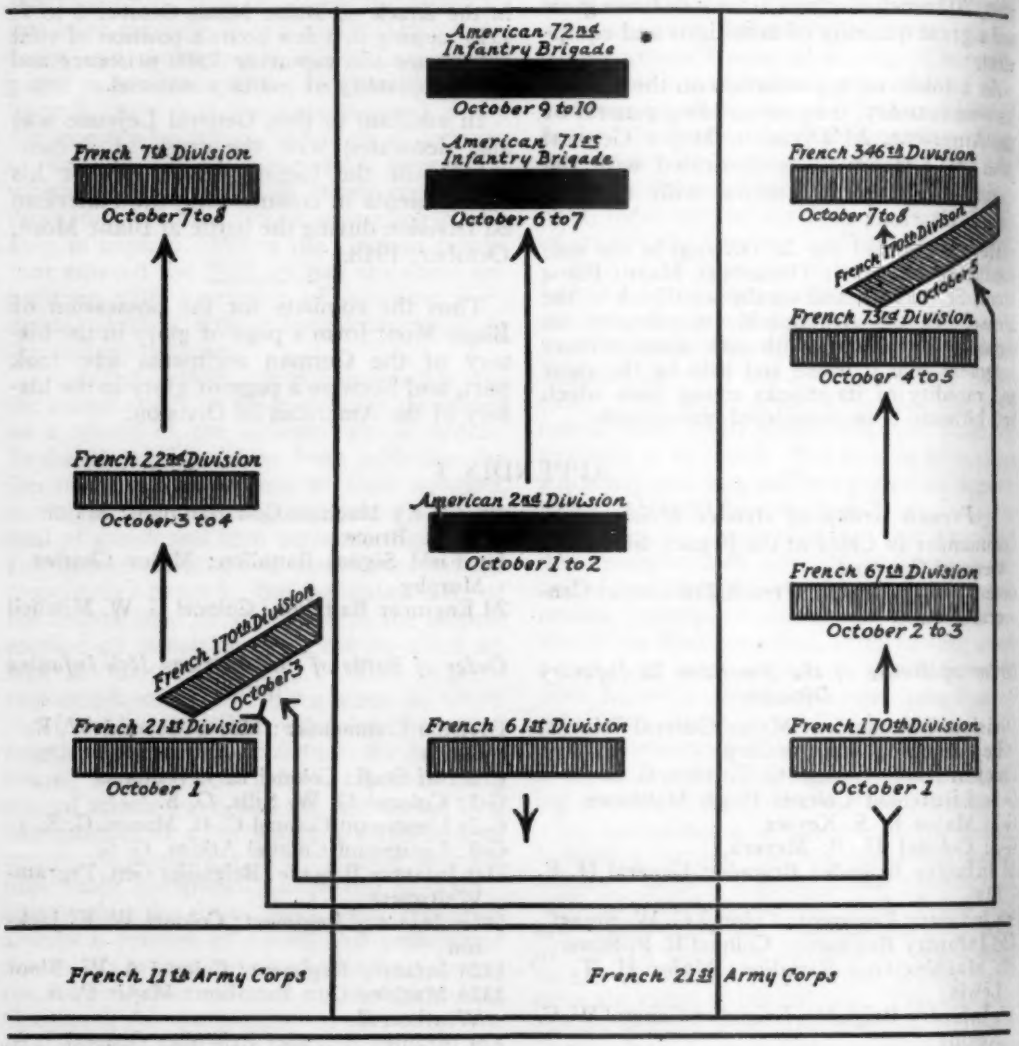
Order of Battle of the American 36th Infantry Division

Division Commander: Major General W. R. Smith
Chief of Staff: Colonel E. J. Williams
G-1: Colonel G. W. Sills, G. S.
G-2: Lieutenant Colonel C. H. Mason, G. S.
G-3: Lieutenant Colonel Atkins, G. S.
71st Infantry Brigade: Brigadier Gen. Pegram-Whitworth
141st Infantry Regiment: Colonel W. E. Jackson
142d Infantry Regiment: Colonel A. W. Bloor
132d Machine-Gun Battalion: Major P. A. Weatherred
72d Infantry Brigade: Brigadier General J. A. Hulen
143d Infantry Regiment: Colonel J. S. Hoover
144th Infantry Regiment: Colonel J. S. Parker
133d Machine-Gun Battalion: Major L. S. Davidson
131st Divisional Machine-Gun Battalion: Major Ellis Stephenson
111th Field Signal Battalion: Major G. A. Robinson

AUTHOR'S NOTE: No artillery regiments and engineer battalions were attached to this division.

APPENDIX II

Scheme of Reliefs of the American 2d Division and the Right and Left Neighboring Divisions (French)



* This infantry brigade was not employed in lines before the afternoon of October 10, 1918.

APPENDIX III

Group of Armies, German Crown Prince

Commander in Chief: General of Infantry, His Imperial Highness, the German Crown Prince.
Chief of Staff: Major General Count von der Schulenburg.
Operations Officer (I-a) of the General Staff: Major von Bock.

Army Headquarters, German 3d Army

Commander in Chief: General-Oberst von Einem, called von Rothmaler.
Chief of Staff: Lieutenant Colonel von Klewitz.
I-a of the Staff: Major Sehmsdorf.

Corps Headquarters, 12th (Saxonian) Army Corps Group Py

Commanding General: General of Cavalry Krug von Nidda.
Chief of Staff: Lieutenant Colonel von Metzsch.
I-a of the Staff: Major Körner.

Order of Battle of the 15th Bavarian Infantry Division

Division Commander: Major General Siebert.
I-a of the Staff: Major Sperr.
23d Bav. Inf. Brigade: Major General Ritter von Hübner
30th Bav. Inf. Regt.: Major Schemmel
31st Bav. Inf. Regt.: Major Reiss
32d Bav Inf. Regt.: Lieutenant Colonel Unna
Artillery Commander: Colonel Gramisch
7th Bav. Field Art.: Major Schwarzenberger
23d Foot Art. Bn.
24th and 25th Pioneer Bn's.

Order of Battle of the 51st Reserve Division

Division Commander: Major General von Kleist
I-a of the Staff: Captain Count von Westarp
102d Res. Inf. Brigade: Colonel von Ledebur
234th Res. Inf. Regt.: Major Ebel
235th Res. Inf. Regt.: Major Doerstling
236th Res. Inf. Regt.: Major Bauer
Artillery Commander, 51st: Lieutenant Colonel Meyer
51st Res. Field Art. Regt.: Major Hevelke
51st Res. Pioneer Company.
7th Co., 28th Pioneer Company.

APPENDIX IV

Order of Battle of the 203d Infantry Division

Division Commander: Major General Kaupert
I-a of the Staff: Captain Heinrici
405th Infantry Brigade: Colonel Wobring
406th Infantry Regiment: Major von Götz
409th Infantry Regiment: Major Geiseler
410th Infantry Regiment: Major von Neuhaus
Commander 203d Artillery: Major Hohmann
403d Field Artillery Regt.: Major Hardt
2d Detachment, 8th Foot Art.: Captain Heiberg
1st Replacement Co., 23d Pioneers.
403d Pioneer Company: Lieutenant of Res. Erdmann

Order of Battle of the 213th Infantry Division

Division Commander: Major General Count von Hammerstein
I-a of the Staff: Captain von Manstein
37th Res. Inf. Brigade: Colonel von Götzen
149th Infantry Regiment: Major Gründel
74th Res. Inf. Regiment: Major Streit (repres. Major Seyffert, on leave of absence)
368th Infantry Regiment: Lieutenant Colonel Mannkopff
Commander 213th Artillery: Colonel Woltag
272d Field Art. Regt.: Major Kusserow
79th Foot Art. Battalion.
284th Pioneer Company.
2d Co., 18th Res. Pioneer Bn.: Lieut. of Res. Böhnke

Order of Battle of the 17th Infantry Division

Division Commander: Major General von Held
I-a of the Staff: Captain von Mackensen-Astfeld
34th Infantry Brigade: Colonel Count von Wangenheim
75th Infantry Regiment: Lieutenant Colonel Hagedorn
89th Grenadier Regiment: Major de Rainville
90th Füsilier Regiment: Major Damman
Commander 17th Artillery: Colonel Nothnagel
60th Field Art. Regiment: Major Count zu Puttlitz
1st Detachment, 24th Foot Art. Bn.: Captain Murzel
1st Co., 9th Pioneer Battalion: Lieut. of Res. Puttfarcken
5th Co., 9th Pioneer Battalion: Lieutenant Körfer

APPENDIX V

Order of Battle of the 200th Infantry Division

Division Commander: Major General von Below
I-a of the Staff: Captain Lindemann
2d Jäger Brigade: Colonel Lehmann*
3d Jäger Regiment: Major von Jena
1st Bn., 3d Jäger Regt.: Lieutenant Blumenau
2d Bn., 3d Jäger Regt.: Lieutenant Kahrs
3d Bn., 3d Jäger Regt.: Captain von Tippelskirch
4th Bn., 3d Jäger Regt.: Captain of Res. Denzel
4th Jäger Regiment: Major von Bülow
5th Res. Jäger Battalion: Captain of Res. Crantz
6th Res. Jager Battalion: Captain Klemke
11th Jäger Battalion: Captain Balla
5th Jäger Regiment: Major Wild
17th Res. Jäger Battalion: Captain von Grone
18th Res. Jäger Battalion: Captain Stoffleth
23d Res. Jäger Battalion: Captain von Freesen
Artillery Commander 62: Major Rosenbaum
22d Field Art. Regiment: Major Gerstenberg
1st Bn., 26th Foot Art. Regt.:

105th Pioneer Company.
282d Pioneer Company.

Order of Battle of the 195th Infantry Division

Division Commander: Major General Weidner
I-a of the Staff: Captain Kaempfe
101st Res. Inf. Brigade: Major General Schmidt* (see footnote)
6th Jäger Regiment: Lieutenant Colonel von Cranach
5th Jäger Battalion: Major Wegener
6th Jäger Battalion: Captain Count von Sissner

* AUTHOR'S NOTE: These Jäger battalions had four infantry and two machine-gun companies and consequently possessed a greater combat value than the infantry battalions, which had only one machine-gun company each.

2d Res. Jäger Battalion: Captain Witthoeft
8th Jäger Regiment: Lieutenant Colonel von Meerscheidt-Hüllesen
4th Res. Jäger Battalion: Captain of Landwehr Fennrich
16th Res. Jäger Battalion: Captain of Res. Reinwirt
24th Res. Jäger Battalion: Captain Dallmer
14th Jäger Regiment: Lieutenant Colonel Riesenthal
15th Res. Jäger Battalion: Major Bornhausen
19th Res. Jäger Battalion: Captain von Bonin
22d Res. Jäger Battalion: Captain von Mandelsloh
Commander 195th Artillery: Lieutenant Colonel Kadelbach
260th Field Art. Regt.: Major von Hildebrandt
1st Detachment 7th Foot Art.: Captain Klein
1st Co., 32d Res. Pioneer Bn.
55th Res. Pioneer Company.

THE END

Courtesy Lieutenant Colonel Ernst Otto, German Army

THE GERMAN COUNTERATTACK ON OCTOBER 9, 1918
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Courtesy Lieutenant Colonel Ernst Otto, German Army

ADVANCE OF A GERMAN MUNITION COLUMN IN DIFFICULT COUNTRY

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Courtesy Lieutenant Colonel Ernst Otto, German Army

GERMAN INFANTRY RESERVES CONCEALED IN TRENCH FOR COUNTERATTACK

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A GERMAN CAPTIVE BALLOON HAULED DOWN

During enemy air raids and in the evening after finishing observations, the captive balloon was pulled in with motor windlasses.

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Courtesy Lieutenant Colonel Ernst Otto, German Army

GERMAN ANTIAIRCRAFT GUN ON MOTOR LORRY

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Courtesy Lieutenant Colonel Ernst Otto, German Army

ADVANCE OF A GERMAN BALLOON DETACHMENT

The bringing up of the heavy motor windlasses for the observation balloons and the store wagons was difficult in the shot-up terrain.

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The bringing up of the heavy motor windlasses for the observation balloons and the store wagons was difficult in the shot-up terrain.
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Courtesy Lieutenant Colonel Ernst Otto, German Army

THE GERMAN HEAVY ARTILLERY BURNS SMOKE POTS

To avoid being seen during the firing by the observation units of the air force.

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Courtesy Lieutenant Colonel Ernst Otto, German Army

GERMAN INFANTRY WORKS ITSELF FORWARD TO ATTACK IN GROUPS

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Disarmament Before 1914

By LIEUTENANT (J. G.) FREDERICK J. BELL, *U. S. Navy*

THE idea of universal arms reduction is not new. To discover a means of limiting the expense of armament without diminishing national security has been the political goal of various statesmen for the past two hundred years.

The object of the following pages is to relate briefly the growth of the idea of arms limitation and to demonstrate, by examples, that among all of the projected means of effecting arms reduction considered by various conferences, there are three that appear time after time, any one of which, if contributory and qualifying factors could be agreed upon, would seem to solve the problem.

Prior to 1713 the idea of arms limitation does not appear in the writings of the principal exponents of universal peace. Many theories and projects for a world confederation, bound by ties of kinship or religion, are to be found in the works of early authors, but those few who refer to armaments regard the matter as occupying a relatively unimportant place in their generally visionary schemes. As one writer explains:[1] "With them, the diminution of armaments plays only a secondary part; to their mind it will be the natural consequence of the new organization."

In 1713 the Abbé Charles Irénée de Saint-Pierre published, at Utrecht, his *Projet de Paix Perpétuelle*, setting forth a plan for a world confederation, but differing from previous projects of like nature through the statement that the successful application of his proposal would permit nations to decrease the cost of their military establishments. This prediction, published while negotiations ending the War of the Spanish Succession were in progress, must have interested the war-ridden nations, but Saint Pierre, before he had an opportunity to elaborate upon his plan, fell into disfavor at court, and his *Projet*, save for its influence upon Rousseau, who embodied a part of it in his writings, was not permitted practical demonstration.

At the conclusion of the Seven Years' War Frederick the Great was approached by the Austrian chancellor with a plan for simultaneous diminution of the land forces of Prussia and Austria. The proposal called for a drastic reduction and provided for a commission composed of representatives of the two states to ensure mutual and proper compliance with the suggested agreement. But Frederick declined to enter into any disarmament negotiations both on this occasion and, again, in 1769, when the Austrian Emperor declared his willingness for a mutual arms reduction.

In his treatise, "On Eternal Peace," which appeared in 1795, Kant advanced the argument that armaments constitute a menace to peace. He proposed the abolition of permanent armies. Kant, however, aimed this statement at monarchy. Kings were the causes of armaments. Then do away with kings and armament. Let war be declared by popular vote; result—there will be no war. Durant, commenting on this fallacious bit of reasoning says,[2] "How contemporary truth is."

The first instance of an American agreement on arms limitation occurred in 1815 when President Monroe, bearing in mind the recent naval actions on the Great Lakes, and realizing that the presence of foreign warships in this theater constituted a menace too vital to be viewed with disinterest, proposed to the British a concerted diminution of vessels of war in these waters.

The ensuing negotiations terminated in the Rush-Bagot convention, proclaimed at Washington on April 28, 1818, which stated:

> The naval force to be maintained upon the American lakes by His Majesty and the Government of the United States shall henceforth be confined to the following vessels on each side: that is,

[1] Wehberg. *The Limitation of Armaments*, p. 5.

[2] Durant. *The Story of Philosophy*, p. 310.

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on Lake Ontario, to one vessel not exceeding one hundred tons burden, and armed with one eighteen-pound cannon; on the Upper Lakes to two vessels not exceeding like burden and armed with like force. All other armed vessels on these lakes shall be forthwith dismantled and no other vessels of war shall be there built or armed. If either party should hereafter be desirous of annulling this stipulation, or should give notice to that effect to the other party, it shall cease to be binding after the expiration of six months from the date of such notice. The naval force so to be limited shall be restricted to such services as will in no respect interfere with the proper duties of the armed vessels of the other party.

While this treaty was in the process of evolution the English government received disarmament suggestions from another quarter. In 1816 Alexander I of Russia addressed a note to Lord Castlereagh, the British Foreign Secretary, in which he wrote: "It is necessary that disarmament be effected with the same agreement and striking loyalty that has decided the safety of Europe and which alone can ensure its happiness."

This note to England was merely another step toward the establishment of a world confederation, with mutual disarmament, which the Czar had been advocating since the close of the Napoleonic Wars. His first attempt had, in fact, been made at the Congress of Vienna, in 1814, when, in the midst of the victorious allies' scramble for territorial distribution, he advanced a plan for a general limitation. The allies, distrustful of the growing power of Russia, regarded the Czar's scheme as part of an ambitious political intrigue and would have none of it. So the Congress busied itself with other and happier negotiations, which were brought to a sudden close by the return of Napoleon and the subsequent Hundred Days.

In his reply to the Czar's proposal Castlereagh said: "It is nevertheless impossible not to perceive the complications which this question presents in the establishment of a scale of forces for so many powers who are in such varying circumstances with regard to their relative means, their frontiers, their position, and their ability to arm themselves again." He added that impetus would be given to disarmament if[3] "a great power like Russia would in some degree reduce her military force; certainly an exclusive system of precaution on His Majesty's part might retard the general tendency of the public disposition of Europe to peace." Alexander refused to act on this hint, giving as his reason, "the agitation of the times."

In the "scale of forces" that Castlereagh senses would be difficult to establish, we see the forerunner of our present-day "naval yardstick" which has been such a bugbear wherever disarmament is considered.

The Czar's attempts, and the subsequent support which he received from Metternich, resulted in a conference held in February, 1817, when the allied powers agreed to reduce by one-fifth the size of each power's contingent in the army of occupation in France.

In 1831, at a conference on disarmament called by Louis Philippe, and attended by representatives of France, England, Russia, Prussia, and Austria, the following protocol was signed:[4]

The undersigned, for the purpose of strengthening the general peace and relieving the peoples of the burden of the extraordinary armaments which have been imposed upon them, have recognized with a keen satisfaction, after a careful examination of the present situation in Europe, that the relations of union and of good harmony happily established among the powers and based upon the independence of the states as well as upon the unalterable principle of the maintenance of treaties, rendered possible today the adoption of a measure which forms the object of the most ardent wishes of their governments, namely, that of a general disarmament.

Despite the formidable optimism of the protocol, the conference achieved no results of any lasting importance and, for the next thirty years, the European powers were too absorbed in dealing with domestic unrest to pay very much attention to disarmament projects. A few desultory efforts to effect an agreement on the arms question were made in the British Parliament and various statesmen declared themselves in favor of a conference, but there were no formal overtures.

In the two years preceding the Franco-German War numerous attempts were made to reduce the size of the armies of France and Prussia. Napoleon III viewed with mistrust the rapid growth of Bismarck's strength and the progress of the German states towards unification, a project which, if attained, would, in the eyes of the French, constitute a menace to their eastern border and disturb the balance of power on the Continent.

This contingency required at least parity

[3] *The Cambridge History of British Foreign Policy*, Vol. II, p. 18.

[4] Wehberg. *The Limitation of Armaments*, p. 9.

between the two armies. This in turn necessitated an increase in the French forces which would compel an enlargement of the Prussian army, and the French people, already burdened with taxation and conscription, would not favor a policy of arms competition. Napoleon hoped that Prussia might agree to a simultaneous disarmament but, fearing the consequences in the event of an abrupt refusal, he chose to negotiate through the British government. The British, at first, refused to act but, two years later, in February, 1870, Lord Clarendon forwarded a disarmament suggestion to Bismarck. The moment was not propitious. Bismarck realized that France was opposed to German unification but was not sure that she would employ force to halt his course of action. Moreover he was afraid that any careless political move on the part of Prussia would weaken the ties with which he was attempting to bind the South German states and jeopardize the renewal of treaties with them due to expire the following year. In short, Bismarck refused to negotiate, and did not lay the matter before the King.

Undiscouraged, Clarendon made a second attempt in March. He pointed out that France had reduced her army from 100,000 to 90,000 men, and added:[5]

> The military forces of the great continental powers have a certain proportion to each other; in order to maintain that proportion very heavy burdens are imposed upon each country; but if, by common agreement, each reduces its army by a certain number of men the same proportion will be maintained, while the burdens, which are fast becoming intolerable, will be alleviated.

On this occasion Bismarck carried the matter to the King, who declared that the German army could only be reduced in two ways, either by changing its legislative basis or by reducing the period of military service. The former method, he added, was impossible; the latter had been the subject of a five-year struggle between King and Parliament and he would not yield on it. Moreover, he regarded the proposal as put forward in the interests of France, and as showing no regard for the safety of Prussia.

The negotiations came to naught, their failure being brought about largely by mutual distrust and lack of confidence. Four months later war was declared.

The half century immediately preceding the World War might be called, if not an era of peace, at least one of peace conferences, for during that period, when the world was never free from actual or impending war, a dozen or more conferences met for the purpose of discussing means for the furtherance of world peace. In all of them the question of arms reduction was brought up and any number of hopeful resolutions were passed, expressing the mutual desire of the various states that a satisfactory method for limiting armaments be evolved, but very little progress was made toward actual disarmament. The idea was too startling, the outcome too uncertain. Nations that were just commencing to assert themselves in world politics saw in certain aspects of disarmament a possible hindrance to their future actions and a threat at their newly acquired and jealously guarded sovereign rights. The stronger states, having won their position by strength of arms, did not care to endanger what they had obtained through the hasty acceptance of some untried scheme. No state felt qualified to place itself in a position which might prove embarrassing because of obligations incurred through the acceptance of proposals that, on all sides, were thought either too drastic or too chimerical adequately to solve the question of arms competition.

In view of the difficulty of securing international unanimity of opinion regarding the military needs of individual states, it is not surprising that the majority of disarmament negotiations have met with failure.

On August 24, 1898, the Russian foreign minister placed in the hands of representatives of foreign powers at St. Petersburg a circular proposing a disarmament conference, stating that[6] "the maintenance of universal peace, and a possible reduction of the excessive armaments which weigh upon all nations represents, in the present condition of affairs all over the world, the ideal toward which the efforts of all governments should be directed." It added that: "The ever-increasing financial burdens strike at the root of public prosperity."

The scope of the proposal, thus abruptly expressed, was too narrow to receive a cordial reception, so Mauravieff addressed another circular elaborating upon the Czar's original plan, and suggesting eight topics for

[5] *The Cambridge History of British Foreign Policy*, Vol. III.

[6] *Ibid.*

a conference. Four of them dealt directly with armament limitation, viz.:

(1) The prohibition for a fixed term of any increase of the armed forces beyond those then maintained.
(2) The prohibition of, or limitation in, the employment of new firearms or explosives.
(3) The restriction of the explosives already existing, and the prohibition of the discharge of projectiles or explosives of any kind from balloons or by any similar means.
(4) The prohibition in naval warfare of submarine torpedo boats or similar engines of destruction, and the ultimate abolition of vessels with rams.

Twenty-six states finally accepted the invitation, and the conference met at The Hague on May 20, 1899. Under the presidency of the senior Russian delegate various committees were formed to study and report upon the many suggestions that had been received.

The first question discussed was the Russian proposal for the suspension of land armaments over a period of five years, and the maintenance in *status quo* of the military budgets then existing.

Germany and France, while admitting that a decrease in military expenditure would permit the money thus liberated to be used for economic and commercial improvements, regarded the difficulties in reaching an agreement as unsurmountable. Other states felt that no international understanding could be reached, so the Russian proposals were rejected.

Another plan was to determine for several years the size of the naval budgets, and to agree not to increase the sums during the period, and to publish, in advance:

(a) The tonnage of new ship construction.
(b) The number of officers and men in the navy.
(c) The expenses of coast fortifications.

The United States, England, France, etc., declared that they could not obligate themselves in the matter of military expenditures, and this plan, too, was rejected.

After refusing to discuss the proposal that[7] "the only effective means would perhaps be to have recourse to penal clauses against the inventors of new means of destruction," the committee considered a plan to restrict the size of guns or maintain the calibers then in use.

In objecting to this Admiral Fisher, the British technical delegate, called attention to the difficulties of supervision, and to the fact that small nations, economically restricted in the amount of armament, would not be disposed to restraint in regard to new inventions.

The fourth question, dealing with submarines and rams, was not extensively discussed.

The upshot of the discussions was the agreement that, while disarmament appealed to the popular imagination, the practical difficulties of arriving at any solution acceptable to everyone rendered success virtually impossible. So the conference contented itself with adopting, unanimously and with applause, the following resolution and *voeu*, committing no one:

Resolution: The conference is of opinion that the restriction of military charges, which are at present a heavy burden on the world, is extremely desirable for the increase of the material and moral welfare of mankind.

Voeu: The conference expresses the wish that the governments, taking into consideration the proposals made at the conference, may examine the possibility of an agreement as to the limitation of armed forces by land and sea, and of war budgets.

In 1902 there was enacted between Argentine and Chile a convention for the limitation of naval armaments. Narrowly restricted in scope, and containing limiting reservations which lowered its binding force, this convention was noteworthy chiefly because it was the first practical accomplishment in the field of modern naval limitation.

The two governments bound themselves not to increase naval armaments over a period of five years without a previous eighteen months' notice. Coast-defense vessels were excluded from the agreement, and, it is interesting to note, submarines were included in this category, as being "floating machines destined exclusively for the defense of coasts and ports."

In the protocol of the convention, arrangements were made for the sale of certain warships being built for the two signatory nations in Italy and England, and for disarming one Chilean and two Argentine battleships.

In regard to the importance of the convention Wehberg says:[8] "....at the same time

[7] Wehberg. *The Limitation of Armaments.*

[8] *Ibid*, p. 25.

that the suspension of armaments in Argentine and Chile took place, a striking decrease in armaments can be noted in other states of South America." However, he quotes Fried as stating that "at the expiration of the convention, the two states seem to have taken up their armaments again."

The Second Hague Conference was proposed as early as 1904 by President Roosevelt. Delayed by the Russo-Japanese War, it was not until April 3, 1906, that invitations were addressed by the Czar, who had expressed a wish to summon the conference, to which the President acceded. The circular suggested numerous topics for discussion, but did not mention disarmament.

In accepting the invitation the British government reserved the right to suggest other questions of international interest, the foremost of which was the matter of expenditure on armaments.

Grey, in instructing the British delegates, directed them to support the United States in any discussion favoring the reduction of such expenditure, and authorized them to say that Great Britain would agree to a proposal that the various states communicate with each other in advance their programs of new naval construction, which, while not directly productive of decreased expenditure, might[9] "provide opportunities for negotiation that do not now exist, and would tend to alleviate the burden of expenditure."

The efforts of the British and other delegates to bring disarmament into the Second Hague Conference failed because of German opposition. The question of military expenditure was dismissed with the declaration "that it is eminently desirable that the governments should resume the serious examination of this question."

From about 1906 until the beginning of the World War, Great Britain, in addition to restating her policy toward a general disarmament, made several attempts to arrive at a bilateral agreement with Germany.

After launching a program of naval construction which, if completed, would place them on a parity with the first sea power, the Germans soon found that any such scheme would not go unchallenged. England's answer was a decision to modify the two-power standard, which had been the basis for her naval building, and to substitute therefor a policy of "two keels for one," or two British ships for each single German ship laid down. This plan served to intensify German desire for sea power, and it was soon apparent that unless steps were taken public sentiment in the two countries would lead into dangerous areas. Great Britain temporized and reached a more or less official understanding with Germany that a ratio of 16-10 would be maintained between the two nations. Even this was not entirely satisfactory and from 1911 to 1914 England tried to negotiate with Germany to the end that some agreement could be reached fixing a scale between the two navies and bringing to a close the naval competition that was both an enormous expense and a direct cause for mutual distrust.

During this period the British renewed their suggestion for an exchange of information regarding naval construction. While many German statesmen, including von Bethman-Hollweg, favored the idea, the German press and public opinion were opposed.

In 1913 Mr. Churchill, speaking in the House of Commons, advocated a one-year naval holiday between Germany and Great Britain, saying, "it is so simple that it could lead to no misunderstanding." He added that the 16-10 proportion, agreed to, in the main, by both countries, had been reached, so his proposal would involve no alteration in the relative strength of the navies.

Von Tirpitz, referring to this speech in his *Memoirs*, says:[10] "In a very involved form Churchill made one more attempt to break the neck of the navy bill by proposing a year's holiday from naval shipbuilding. The unfavorable reception of this idea in England, however, relieved us of the necessity of going into it in any detail."

In all of the cases cited the reason advanced for a limitation of armaments has been either:

(1) To decrease military expenditure.
(2) To prevent armament competition.

A modern writer on the subject says:[11]

> The object of a disarmament policy is to make an international agreement which shall strike a balance between the armaments maintained by different nations at a level lower than that which they at present maintain, without either involving injustice as between one nation and another, or ex-

[9] Sir Edward Grey to Sir Edward Fry. June 12, 1907.

[10] Von Tirpitz. *My Memoirs*, Vol. I, p. 306.
[11] P. J. Noel Baker, *Disarmament*, p. 37.

posing any of them to dangers to their national security to which they are not exposed when they are free to maintain whatever armaments they please. [He adds:] This object is made more difficult to achieve by various factors arising out of and peculiar to the conditions of modern war.

To achieve arms limitations three general projects have been advanced:

(1) Reduction of the budget.

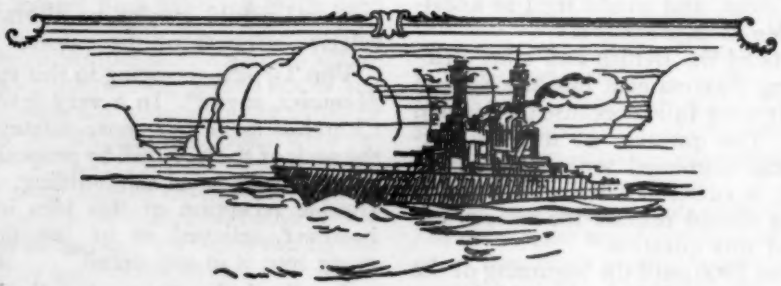
(2) Reduction of the number of men or ships.

(3) Reduction of naval tonnage.

A naval holiday, either with or without any of the above, has also been advocated, and, at times, adopted.

Frequently, in the course of history, a nation victorious in war has imposed disarmament upon the vanquished, but such compulsory arms reduction, employed to further weaken an already beaten enemy, has not usually been followed by similar reduction on the part of the victor.

Post-war conditions have broadened the scope of arms limitation and brought the attainment of international agreement considerably closer. The presence of disarmament as a topic of world interest in the public mind cannot be denied. By reviewing the various attempts at disarmament prior to 1914 it is possible to form a clearer conception of the obstacles to be overcome and the mistakes to be avoided before there can be any hope of obtaining an arms settlement concomitant with national needs.



What Price Leadership?

By COMMANDER LUCIUS C. DUNN, *U. S. Navy*

LEADERSHIP is a word which implies volumes in the broad realm of human relationships. Abstract? Yes, but the supposedly concrete definition as gleaned from two standard dictionaries—"ability to lead"—seems equally unsatisfactory and lands us no nearer our goal of exact definition. Indeed, unless we confine ourselves within the realm of human relationships, the dictionary may even take us far afield; the old saw, "you may lead a horse to water but you can't make him drink," undoubtedly implies ability to lead in a sense, but not in that exalted sense with which our present paper would deal.

Reverting, then, to the realm of human relationships, there is brought into our picture the long list of human attributes—truthfulness, loyalty, honor, tact, simplicity, knowledge, judgment, reflection, common sense, courage, self-control, justice, earnestness—to catalog but a few of the virtues usually associated with human endeavor.

We come now to the specific application of leadership in a military sense—the ability to lead men. And while leadership in general may be said to comprise a harmonious blending of all the human virtues rather than emphasizing any particular one of them, the assertion is here made boldly that in military leadership a keen insight into human nature, coupled with a goodly supply of what the old "darkey" has appropriately termed the "sixth sense"—common sense—top the list of those attributes in producing that magnetic something which makes a man stand forth from his fellows like a figure in bas-relief upon the major plane of the stone from which it was hewn. Furthermore, leadership demands professional knowledge and a high degree of personal character. Another defines military leadership as "the science of creating and maintaining a high morale, and of directing it through the acts of men to the achieving of a definite purpose or result." Manifestly, it is that something which causes men to "grasp the purpose of a commander," creating in them the urge to "strive to advance it with force and energy."

Continuing our quest for golden words upon the subject, and especially from the pens of some generally recognized leaders not only of the past but of the present as well, it is considered that no better lines have been penned on the subject, particularly from the purely naval angle, than certain of those contained in John Paul Jones's letter of 1775 to the Marine Committee of the Continental Congress. Says our illustrious admiral:

> It is by no means enough that an officer of the Navy should be a capable mariner. He must be that, of course, but also a great deal more. He should be as well a gentleman of liberal education, refined manners, punctilious courtesy, and the nicest sense of personal honor. . . . . The naval officer should be familiar with the principles of international law. . . . . He should also be conversant with the usages of diplomacy and capable of maintaining . . . . a dignified and judicious diplomatic correspondence. . . . . Coming now to view the naval officer aboard ship and in relation to those under his command, he should be the soul of tact, patience, justice, firmness, and charity. No meritorious act of a subordinate should escape his attention or be left to pass without its reward even if the reward be only one word of approval. Conversely, he should not be blind to a single fault in any subordinate, though at the same time he should be quick and unfailing to distinguish error from malice, thoughtlessness from incompetency, and well-meant shortcoming from heedless or stupid blunder. As he should be universal and impartial in his rewards and approval of merit, so he should be judicial and unbending in his punishment or reproof of misconduct. . . . . In his intercourse with subordinates he should ever maintain the attitude of the commander, but that need by no means prevent him from the amenities of cordiality or the cultivation of good cheer within proper limits. . . . . In one word, every commander should keep constantly before him the great truth, that to be well obeyed he must be perfectly esteemed. . . . . His authority when offshore being necessarily absolute, the crew should be as one man impressed that the Captain, like the Sovereign, "can do no wrong"! This is the most delicate of all

the commanding officer's obligations. No rule can be set for meeting it. It must ever be a question of tact and perception of human nature on the spot and to suit the occasion. . . . . When a commander has, by tact, patience, justice, and firmness each exercised in its proper turn, produced such an impression upon those under his orders in a ship of war, he has only to wait the appearance of the enemy's top-sails upon the horizon. . . . . All these considerations pertain to the naval officer afloat. But part, and often an important part, of his career must be in port or on duty ashore. He must be of affable temper and a master of civilities. . . . .

And then again, another great leader, Admiral Sims, in his lecture on "Military Character"[1] says:

We all know in a general way that a man upon whom is placed a great responsibility in a great war, a Joffre or a Jellicoe, should not only be a model of virtue, honor, patriotism and subordination but that he should have a thorough knowledge of his profession, and the self-confidence which this renders possible. Also a strong will, great decision of character, resolution, energy, loyalty to his government, his cause, and his subordinates, willingness to accept and ability to bear responsibility, fortitude in adversity, boldness in conception, caution in execution, imperturbability in council, thoroughness in preparation, besides personal courage, physical vigor, and many other secondary essential qualities.

Some maintain that true leaders are born, not made, that leadership is solely an endowed talent. But this is considered to be a greatly overdrawn view, an idealistic half-truth, and has no basis of solid fact in this practical, everyday life which we lead in a genuinely practical world. The Almighty has graciously equipped man with a brain and has thus provided him with the capacity to learn and to profit by the examples which he sees about him. To take any other view of the situation would produce an exceedingly gloomy outlook for the vast numbers of those of every generation who cherish hopes for command.

Certainly, talent does play its part as a factor of success in leadership as in all other spheres. Similarly, it is maintained that studious application, perseverance, lots of hard work, and the will to succeed through profiting by the example of others also serve to induce self-confidence and go far in overcoming the handicaps of any deficiency in talents. As previously outlined, it is, after all, the prestige of character, self-confidence, professional knowledge, all harmoniously blended with tact and a just appreciation of human nature, which constitute the very keystone of the arch of successful leadership; and the heartening note which here resounds is that all of those factors can be *acquired* if one be willing to pay the price, the price of success: "eternal vigilance" and constant application—hard work. Let us therefore briefly inquire into the lives of some of the great leaders and see if this is not correct.

Take the life of Moses, one of the oldest leaders on record; he that was truly "a sailor babe," the lowly born Jewish child of immigrant parentage, whose "cruise" in the little basket amongst the flags and reeds of the Nile conduced to outwit Pharaoh and his decree of death for the boy. We need only read the Bible's biographical sketch of this great leader to discern the germs of some of the points advanced above. For in the first place, Moses was modest and unostentatious, a basic trait, easily recognizable in a truly great leader. "And Moses said unto God, Who am I, that I should bring forth the children of Israel out of Egypt? . . . . Behold, they will not believe me, nor hearken unto my voice." Thus Moses at first protested and confessed his utter incapability for performing such a huge task. But he was willing to study, learn, and to apply himself to consummating the task in hand.

And then again, Moses was amenable to wise counsel and sound advice—another important attribute of leadership. "And Moses' father-in-law said unto him, The thing that thou doest is not good. Thou wilt surely wear away, both thou and this people that is with thee; for this thing is too heavy for thee; thou art not able to perform it thyself alone." Moses therefore heeded that advice, and accordingly placed upon others some of the burden of details and minor tasks that might well be removed from his shoulders. (Incidentally, there is here suggested a secondary but essential component of leadership: the ability of the leader to select a competent staff or other subordinates upon whom he can place dependence in the matter of details and the execution of minor tasks.) And as a result of all this, we witness Moses gradually acquiring courage, self-confidence, knowledge, reflection, tact, justice, patience, power—in a word, leadership, and this to

[1] By Captain (now Rear Admiral) W. S. Sims, U. S. Navy. See U. S. Naval Institute Proceedings, March, 1917.

such a superb degree that eventually he triumphs over Pharaoh, and finally effects the freedom of his people.

Time has a way of veneering with romance the simple, everyday deeds and of enshrouding with mystery the motives actuating the lives of outstanding men; particularly is this true of great military leaders. Moreover, modern development in the science of psychology and the reams of available biographical facts have done much to "debunk" and dissipate some of that air of romantic mysticism which has surrounded many of the world's great men. Even Napoleon's undisputed success as a leader was due not to any endowed powers, but primarily to his self-acquired power of introspective vision, a profound study of psychology, and the will to master the technique of military leadership. Undoubtedly it is true that from a very early age his mind ran in a channel of things-of-war, creating in every fiber of his growing body the teeming passion for conquest. Veritably, he studied, worked, played, lived, and dreamed of war. This, then, rather than specially endowed talent, is what made of the Corsican such an outstanding exponent of military leadership. And history is replete with similar examples of great leaders: Hannibal, Alexander, Caesar, Washington, Nelson. Moreover, we may be sure that all of them paid the price and trod the same tedious, rugged trail of intensive perseverance, studious application, minute preparation, and possessed the indomitable will to excel.

The moral? Simply that he who would lead should first ask himself the question: "What price leadership?"

Old Tropic

By COMMANDER ALFRED H. MILES, *U. S. Navy*

A seaman in a masquerade
Such as appears to me from the deep,
When o'er the line the merry vessels sweep,
And the rough saturnalia of the tar,
Flock o'er the deck in Neptune's borrowed car,
And pleased, the god of ocean sees his name
Revive once more, though but in mimic fame
Of his true sons.

—BYRON

MANY superstitious observances have been common, from ancient to modern days, among mariners. The ceremony, perhaps best known in our times, is that of "Crossing the Line," celebrated when a ship crosses the terrestrial equator voyaging either north or south. This custom is a remarkable survival of an ancient practice, first begun as an actual worship of some deity, and exists today without significance other than the amusement of the sailors or passengers on board ship.

Anciently the Greeks sacrificed, on nearing any prominent cape upon which temples to the deities were placed. Later, forms were practiced when passing certain remote capes, crossing the arctic circle or upon arrival within the torrid zone. The forerunner of the present-day ceremony appears to have originated in the Middle Ages, when the custom of receiving a fictitious visit from Neptune arose, but it has only been in recent years, since the appearance of steam navigation, that this has been performed when crossing the equator.

An interesting account of the ceremonies performed on a vessel in Admiral de Grasse's fleet which sailed from Brest in 1781 for America is preserved for us in the diary of a French naval officer. This vivid account can hardly fail to excite pleasant (?) memories in the sea dog of today, so faithfully have the details of this rite been handed down to us.

The account is dated "At sea, Tropic of Cancer, July 12, 1781," and runs as follows:

Our voyage continuing favorably, there came up with evening an extraordinary courier of the good old Tropic, to announce to the staff and all the crew, that we would next morning enter the torrid zone, a vast country belonging to his master: that he would come in person, attended by a numerous staff of officers and his high priest, to pay a visit to the captain and those whom he had long known, and to proclaim to the others that no one could sail in the burning region without being first purified and aspersed with the bitter wave, enjoining on each one to examine himself. He made protestations of sincere friendship on behalf of his master, to his old acquaintances. Then with a terrible and very disagreeable noise he returned to the masthead.

On the 13th, at six o'clock in the morning, we heard an extraordinary symphony in the mastheads and rigging; it was old Tropic's couriers. One put himself on guard at the cabin door to await the captain's waking and ask him his hour; he replied that he would be pleased to see his sable majesty at ten.

In consequence, at half-past nine down from the mizzen masthead came twenty sailor boys all naked and all black; they began the march, and announced at the top of their lungs the coming of the hideous sovereign, holding a cup of water in his hand; then down from the foretop came the high priest, robed in white, with white beard and wig, preceded by twelve men bearing books and torches to swear people in; all these ranged themselves on the right. Soon after a superb car appeared in the maintop, formed of shells of sea monsters, drawn by four sharks. This descended to the sound of a rude fouie! mingled with the sound of the extraordinary instruments that had been heard from daybreak. It was preceded by twelve old fellows, younger brothers of the sable monarch, all dressed in red, trimmed with various colors.

They ranged themselves on the right while their elder brother got out of his chariot and went to pay his compliments to the captain. On his return, he again entered his chariot, and ordered his high priest to begin the ceremonies. He accordingly took a seat in front of a table, while two of his people took their seats on stools, beside a tub full of water over which was a plank. An ensign was called and put on the board near the table, and surrounded by the suite of the head chaplain, who asked him his age, how many voyages, by what straits, and on what sea he had sailed; of how many male children he was father, with the circumstantial details of all; whether he had had any connexion with a sailor's wife or daughter; after this they threw water on his head; meanwhile the plank was slipped away and my gentleman found himself with his back in the water, caught so that he could not stir. Then a glass of water was poured on his head, his forehead daubed black, and a plate presented in which he must put a silver piece, after which he was taken out. Another succeeds him, and so it goes through the staff and gentlemen on board, passengers as well as others.

After this there fell a heavy rain from the topmasts, wetting everything; the buckets along the vessel were constantly filled and poured over some one's back. This was kept up some six hours, and during this last ceremony the sable sovereign, the high priest, and their suite, were at the caboose (place where victuals are given out), getting drunk with the money that they had received; this debauch lasted from three to four days.

The Naval Rhodes Scholar

By LIEUTENANT COMMANDER LEON S. FISKE, *U. S. Navy*

I

CECIL JOHN RHODES, South African financier and statesman, was born in Stortford, Hertfordshire, England, in 1853. While studying in grammar school with the intention of preparing for the church, ill health caused by weak lungs forced him to terminate his studies abruptly at seventeen years of age. Advised to leave the damp climate of his native land, he joined an elder brother in farming at Natal, South Africa. That same year diamonds were discovered in the Kimberley district, and so successful in diamond mining was young Rhodes that at the age of twenty he had started the fortune which later grew to millions. He had now become a strong and vigorous young man. Apparently cured of his former ailment, he returned to England and matriculated at Oxford University. His illness soon returned, but by studying intermittently he won his degree after eight years, the extra time having been spent in recuperating in South Africa. Now he was ready to devote himself passionately to the idea which had gradually been crystallizing in his mind for years—the governance of the world by the British Empire. The immediate field for his personal contribution to further this was South Africa. He played a varied but important part in the development and consolidation of this region, but did not live to see the fruition of his desire, the federation of South African states. Rhodes finally succumbed to his weakened constitution in his forty-ninth year.

His will, written after the more violent ardor of his youth had been tempered by mature judgment, dedicated the greater part of his large fortune to the establishment in perpetuity of scholarships at Oxford University. It was Rhodes' purpose through these scholarships to aid in establishing and maintaining a community of thought among the English-speaking nations. That this is desirable seems self-evident. That the Rhodes scholarships contribute to this end cannot be questioned. In his will Rhodes mentions the objects that he had in view in founding the American scholarships:

> I also desire to encourage and foster an appreciation of the advantages which I implicitly believe will result from the union of the English-speaking people throughout the world, and to encourage in the students from the United States of North America who will benefit from the American scholarships to be established for the reason above given at the University of Oxford under this my will, an attachment to the country from which they have sprung, but without, I hope, withdrawing them or their sympathies from the land of their adoption or birth.

The trust created by Rhodes provides about two hundred scholarships, ninety-six of which—two for each state—are awarded in the United States, the remainder being allotted to the various colonies and dominions in the British Empire. The scholarships are for three years with an annual stipend of four hundred pounds. Candidates for the scholarship must be unmarried, between the ages of nineteen and twenty-five, and must have had at least two years of college education. Application is made in the state in which they reside, or in the state in which they have received the major part of their education. Rhodes scholars are selected by committees appointed in each state. The committees are guided largely by the following principles specified by Rhodes:

> My desire being that the students who shall be selected to the scholarships shall not be merely bookworms, I direct that in the election of a student to a scholarship regard shall be had to: (1) his literary and scholastic attainments; (2) his fondness for and success in manly outdoor sports, such as cricket, football, and the like; (3) his qualities of manhood, truth, courage, devotion to duty, sympathy for and protection of the weak, kindliness, unselfishness, and fellowship; and, (4) his exhibition during school days of moral force of character and instincts to lead, and to take an interest in his schoolmates, for those latter attributes will be likely in after life to guide him to esteem the performance of public duties as his highest aim.

No student shall be qualified or disqualified for election to a Scholarship on account of his race or religious opinions.

Are American Rhodes scholars successful? Scholastically, yes—the percentage of American Rhodes scholars who attain highest honor degrees is greater than the percentage of all the students of the University of Oxford who attain highest honor degrees. Concerning after life, it is too early to decide. Too few Rhodes scholars have reached the age when their success or failure in life may be judged. We find, however, American Rhodes scholars occupying positions of importance and prominence. Of those who have engaged in education, over one third have attained full professorships or better, five are college presidents, and one recently was United States Commissioner of Education. Other American Rhodes scholars are employed in government bureaus and in the diplomatic service. Many are already marked for success and eminence in business and the professions. Few are unsuccessful. The experience at Oxford has assisted American Rhodes scholars to become broader minded and better citizens of their own country, more loyal and patriotic.

II

Several years ago a midshipman requested the views of the Navy Department on the question of a naval officer trying for a Rhodes scholarship. The Department, while acknowledging the benefits which would undoubtedly be derived by the individual and the Navy as a whole, informed him that due to the personnel situation existing, it could not at that time authorize a naval officer to accept a scholarship.

About a year ago the question was again considered. After a thorough study of the proposition by both the Navy Department and the Naval Academy, and with the enthusiastic recommendation of all who familiarized themselves with it, the participation of naval officers and midshipmen in the competition for Rhodes scholarships was authorized. Wide dissemination of information of the conditions and requirements was given. That great interest was aroused is shown by the fact that sixty-seven requests to try for a scholarship were submitted. As candidates must, in the first instance, be certified by their own college as representing it, a board of Navy Department and Naval Academy officers reviewed the records of the midshipman and officer applicants, and recommended that seventeen be authorized to compete.

All possible assistance was given to the candidates in perfecting their formal applications for submission to the state committees of selection for Rhodes scholarships. The formal application is very comprehensive—containing photographs, birth certificate, statement from the superintendent indicating that the candidate has been selected to represent the Naval Academy, copy of scholastic record, statement by the candidate outlining in general his activities, accomplishments, and intellectual interests, together with the names of at least five persons to whom the state committee may refer concerning the candidate's qualifications.

The state committees of selection make some elimination of candidates on the paper applications alone, but usually desire their appearance for personal interview. This interview is of great importance to the candidate. Frequently the paper records of two outstanding applicants are approximately equal. The deciding factor then may hinge on such characteristics as conversational ability, social presence, earnestness of candidate in his desire for the scholarship, or the fluency with which he is able to discuss foreign or domestic questions of current interest.

The majority of the seventeen naval applicants personally appeared before their respective state committees. Six were selected and will matriculate at Oxford University in October, 1930. Several who failed of selection were runners-up and have been invited by their state committees to try again next year. No other institution in the United States, except the United States Military Academy with two, had more than one candidate selected this year. No institution ever before has had as many as six selected in a single year. As an interesting sidelight, this record speaks well for the soundness of the educational methods and the scholastic excellence of the curriculum of the Naval Academy, and should be a source of pride to the many officers and instructors who for years have been adding their bit to the academic structure while serving at the Academy. This record seems to be an effective rebuttal to the learned critics who in the past have periodically deprecated

the archaic educational methods in effect at the Naval Academy.

III

The American student finds Oxford unlike any American college or university. Oxford is a university of nearly twenty-five separate colleges, each complete in itself with its own faculty, dormitories, dining hall, chapel, athletic fields, and other facilities. A student is a member of the university only by becoming a member of some one college. Most of the colleges have their glorious traditions, and can claim to have made their imprint on England's history through their members. William Pitt, "the great commoner," was a member of Trinity College, Lord Haig of Bemerside, commander in chief of the British Army during the World War, was a member of Brasenose.

The college is the center of activity for its students. With the university and the other colleges they are very little concerned, except in sports. The colleges have an average undergraduate membership of about 125 students who live together, dine together, and play together. It naturally follows that each student soon learns to know all the other members of his college. The student body is, of course, largely English, with a few foreign students. The English student comes from the gentry of England. He is a well-bred gentleman, conservative, cultured, and reserved. Daily routine in college during the terms consists, for the most part, of from four to six hours of scholastic work, and ten or twelve hours of social intercourse in breakfasts, lunches, dinners, teas, club activities, sports, and fraternizing. Unless he declines to participate fully in these social activities, the American student at Oxford can hardly fail to become well acquainted with Englishmen, their characteristics, customs, and viewpoints.

The Oxford system of education is vastly different from that of any American university. There are no "courses." There is no scheme of daily recitations and marks, no monthly or term examinations. Lectures may be attended or omitted at the option of the student. The Oxford theory is to prescribe generally what the student is supposed to know to earn the degree for which he is striving. He is given a certain length of time to acquire the necessary knowledge. Oxford is rich in educational resources, libraries, lectures, and competent faculty. How or just where he taps these resources is left to the student to decide. To assist him he is assigned a "tutor" to whom he must report weekly. The tutor is the student's guide, counselor, and friend. The "Oxford Examination Statutes," or catalog, outlines in a definite way the scope of the examination which the student must take successfully to secure his degree. With the assistance of his tutor he maps out his own course of study, and starts preparing for examinations which may not come for a year or possibly two years, depending on particular circumstances.

Oxford "opens" in October. There are three terms of eight weeks each with a six weeks' vacation at Christmas and at Easter, and a four months' vacation in the summer. The Rhodes scholar usually spends these vacation periods by settling down in some little town in England or on the Continent and learning the language, manners, and customs of the people in whose land he is temporarily residing. He gets a great deal from these experiences. However, vacation is not all recreation, for, in order to accomplish what he has set out to do, it is usually necessary to spend five or six hours each day in reading and study.

While such a theory of education is apt to strike the American as somewhat nonchalant, the standards of Oxford are probably higher than in American universities. To win the highest honors, the exceptional student must apply himself faithfully, whereas in the United States it is usually only necessary for the exceptional student to apply himself moderately. Oxford generally believes a liberal education to consist of the development of the power of thought in a comparatively narrow field of knowledge, rather than the acquirement of a vast number of facts along many lines.

To the American at Oxford everything seems strange—the college, manner of living, sports, traditions, colloquialisms, regulations for discipline, food, and the Englishman himself, all are entirely different from anything which he has known. The usual sports are rugby football, soccer, cricket, tennis, golf, rowing, and track. Participation is for the sake of sport alone, never to win the acclaim of spectators. In fact, there are few if any spectators, because *everyone* is out for sports. The English student is

quite satisfied to make the second or third team, and would regard as a poor sport one who quit because he was unable to make the college team. The contests are keen, with the participants showing a healthy desire to win, but it is considered far better to lose a game than to take any unfair advantage, either physical or technical. The Oxford student buys his own athletic gear, and pays his own expenses. There are no professional coaches. Under these conditions it follows that sports are viewed from their proper perspective, and have a high social and moral value.

If an Oxonian is late returning from liberty he is fined from a half crown up. Plain clothes university police, commonly known as "bullers," enforce discipline. There are no college yells or songs, no organized cheering, and relatively little cheering at games. Many of the staple articles of American diet are missing from the menu, and the food, though excellent, is monotonous. Central heating is unknown, and the small grate fires are ridiculously inadequate. The American Rhodes scholar, who is essentially a "go-getter" or he would not be at Oxford, is sometimes disgusted with the lack of progress, and is often at first strongly tempted to initiate reforms to bring the place up to date according to American standards. He is wise who reflects that many have been repulsed in trying to reform Oxford, which does not wish to be reformed. The Rhodes scholar is sent to Oxford to study England, and will profit most if he accepts it as it is.

IV

Once having been appointed, a Rhodes scholar may pursue any subject at Oxford that he desires. It seems probable that many of the naval scholars will "read" for a degree in modern languages, or philosophy, politics, and economics. Modern languages appears to promise the greatest benefit to the individual as a naval officer, and so to the Navy. Generally one language—French, Spanish, German, Italian, Russian, or Modern Greek—is studied as a principal language, and one other is studied as a subsidiary language. Studies must be undertaken in preparation for examinations looking towards a degree covering the following subjects in the principal language: (a) the language as spoken and written at the present day; (b) the history of the language; (c) the history of its literature; (d) works or portions of works written in the language; (e) the thought and history of the country so far as a knowledge of them is necessary for the understanding of its literature.

Examinations in the subsidiary language, while not so comprehensive, require the showing of a complete knowledge of the language as it is spoken and written at the present day, and some knowledge of the history of its literature and modern authors. In addition, to win the highest honor degree, students must successfully take an examination in a specially selected subject, such as the philology or literature of some other European language.

From a consideration of the subjects for examination for a degree in modern languages, one can infer in what manner the student benefits. Six months each year are spent in residence at Oxford, chiefly learning the Englishman's viewpoints. Six months each year are spent in those European countries whose languages he is studying. This continues for two years. The third year of the scholarship may be taken at any university in the world except in the United States, and it may be taken immediately or postponed until after a period of years spent back in active service. The scholar of ability and purpose—the naval Rhodes scholar will always be that, selected as he is, first, as superior by the Naval Academy in being permitted to compete, and, second, in competition with candidates from outstanding universities in the United States —becomes familiar with at least three European peoples—including the English—their languages, customs, and manner of thinking.

The work leading to a degree in philosophy, politics, and economics, includes thorough studies in the subjects indicated by the name of the degree, and a working knowledge of at least two of the European languages.

The history of the American Navy antedates that of the republic itself. The theory that the naval officer has always had and always will have quasi-diplomatic duties in his capacity as senior officer of the United States in foreign ports needs no development here. Ease of modern communication with the head of the government has

not lessened the responsibility of the naval officer. Conditions have changed but situations change more quickly today than ever before. Wider governmental participation in world affairs by the United States and tremendously increased commerce require a navy, the principal manifestation of sovereign power, more than ever before. The Navy will go, as always, where national interests lie. The Navy has wisely seen the necessity for broader training for naval officers in keeping with our ever-widening national interests. Navy Rhodes scholars afford one means of meeting this need.

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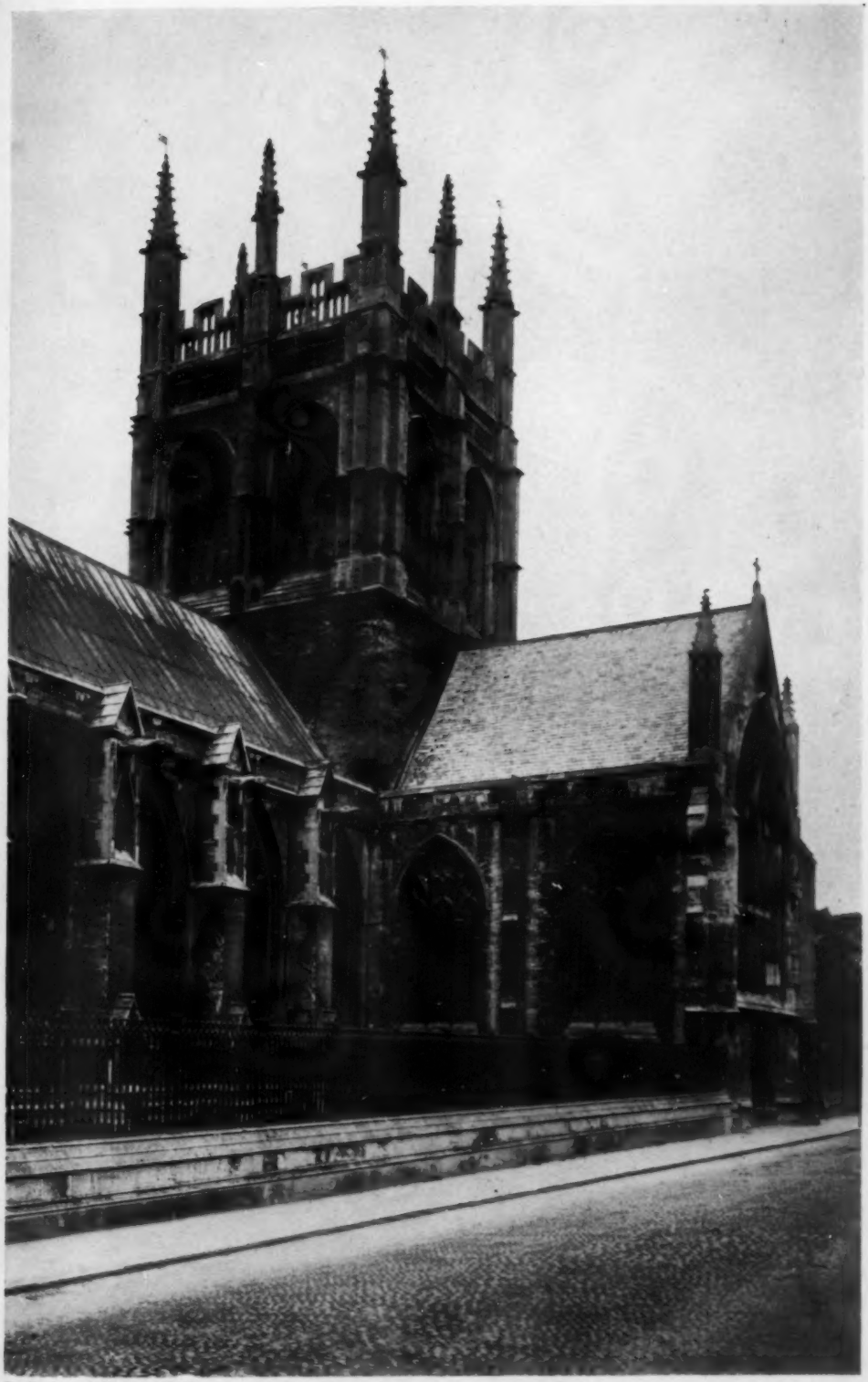

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MERTON CHAPEL, OXFORD UNIVERSITY

XLI

UNIV. OF MICH.

By Aërofilms—From Ewing Galloway, N.Y.

AIR VIEW OF FAMOUS COLLEGES, OXFORD, ENGLAND

Photograph by Ewing Galloway, N.Y.

PANORAMIC VIEW OF THE COLLEGE CITY OF OXFORD, ENGLAND
It has so many colleges the average resident could not name them offhand.

UNIV. OF WICH.

By Ewing Galloway, N.Y.

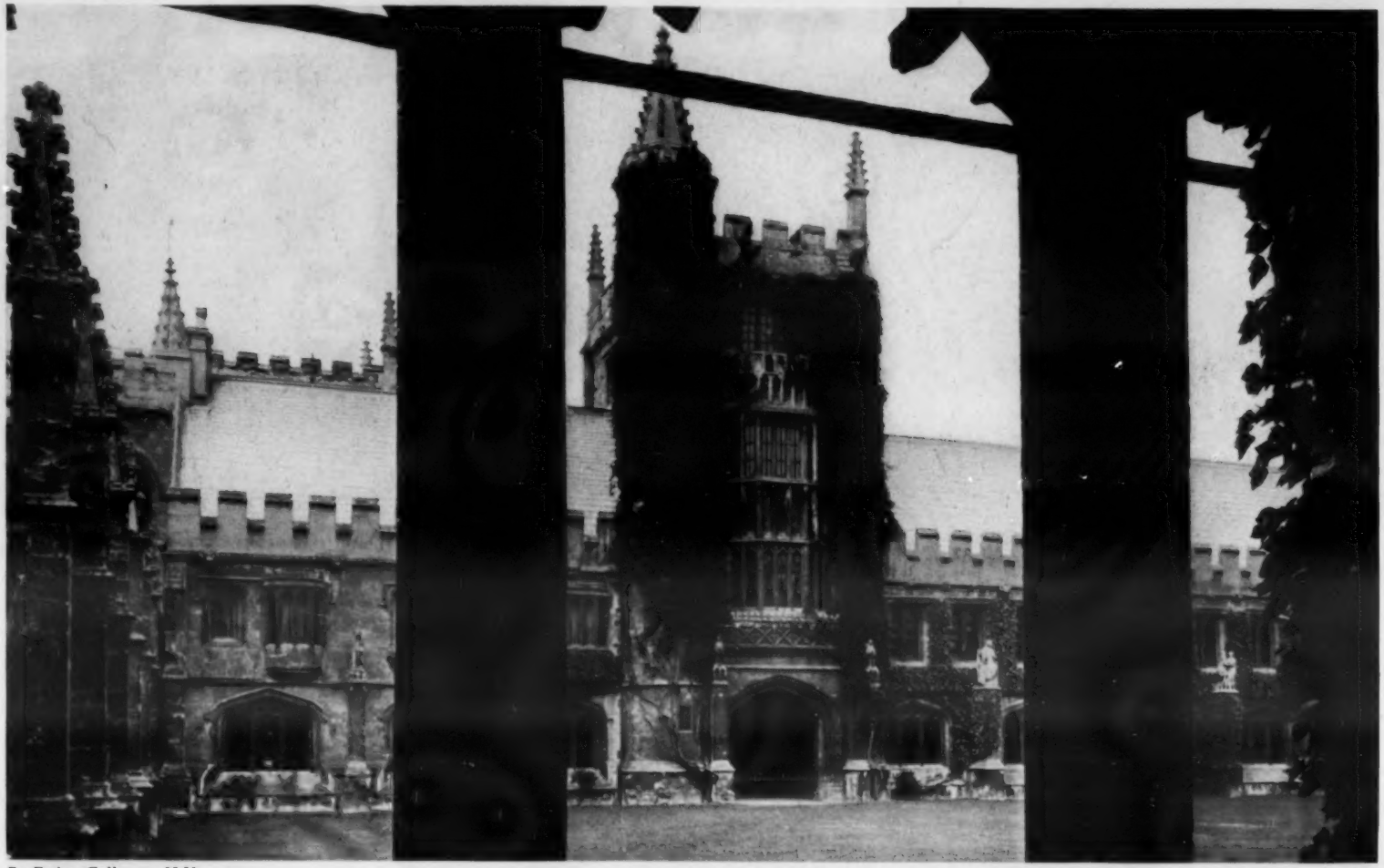
BODLEIAN LIBRARY, OXFORD, ENGLAND
Sheldonian Theater at left.

Sheldonian Theater at left.

By Ewing Galloway, N.Y.

HERTFORD COLLEGE, OXFORD UNIVERSITY

UNIV. OF MICH.



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MAGDALENE QUOD, OXFORD, ENGLAND

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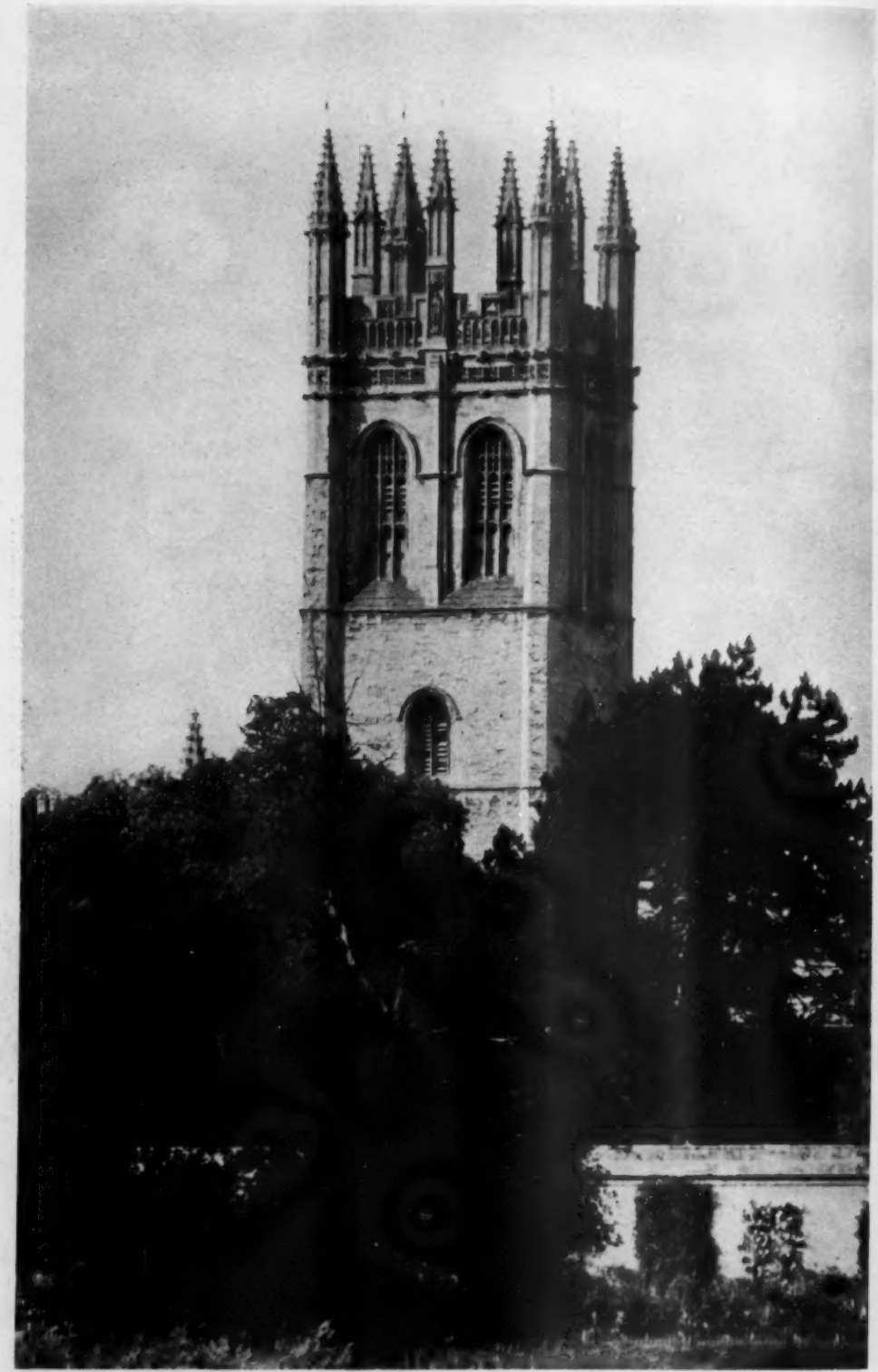
ADDISON'S WALK, OXFORD UNIVERSITY

UNIV. OF MICH.



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AN UNUSUAL VIEW OF THE TOWER OF MAGDALENE COLLEGE, OXFORD, ENGLAND

DISCUSSIONS

The Construction and Repair Department of a Battleship

(See page 965, November, 1929, PROCEEDINGS.)

LIEUTENANT COMMANDER B. S. BULLARD *(C.C.), U. S. Navy.*—Lieutenant Commander De Treville's paper is an interesting article as being concrete evidence of the mental reactions of one who has served a cruise as first lieutenant of a capital ship. To one who has been more or less intimately connected with the Navy for somewhat over thirty-nine years, it is certainly refreshing to learn that prior to about eighteen years ago first-line ships had no executive officers, the second in command prior to that time being called the first lieutenant. It has always been my understanding that naval vessels for many, many years have had executive officers and that the term "first lieutenant" was more or less of a slang expression applied to the second in command in the same manner that the commanding officer is called "skipper." From personal knowledge, I know that there has always been an executive officer in name as well as in fact ever since the first time that I went on board the old *Lancaster* in Montevideo harbor back in 1896. As a matter of fact I remember very distinctly the one time, as a very, very green passed midshipman just out of the Naval Academy, that I made the mistake of calling the executive officer the "first lieutenant" within his hearing.

I well remember when the first lieutenant's job as such was created by official order and I agree thoroughly with the author's statements that since its establishment, the job has grown so that at the present time it is the hardest and most unpleasant one of the head-of-department positions. As a matter of fact, the first lieutenant is a head of department with no personnel under his direct charge other than the boatswain, the carpenter, and only too few deck-rating artificers. In order to accomplish the ship's work of cleaning and preservation, the first lieutenant is dependent upon the personnel of the deck divisions and as these deck divisions are the ones that man the ship's armament, he gets the necessary man power only when it is not being used by the gunnery officer in connection with gunnery training. In other words, the first lieutenant's job is no bed of roses.

Captain Howard (C.C.), in his discussion of this paper, has given very clear reasons why the Bureau of Construction and Repair has retained the cognizance of certain auxiliary machinery. Such reasons appear logical under the present organization of the Navy Department in which the Bureau of Construction and Repair is the agency held responsible for the design as a whole even though it is admitted that cognizance of naval material in many cases has no logical foundation. Whether the organization of the Navy Department should be changed to abolish all of the material bureaus and create in their place two bureaus, one for maintenance and one for design of all naval material, is beyond the scope of this discussion.

The statement of Lieutenant Commander De Treville that the Bureau of Construction and Repair reserves to itself the right to design a great many articles for use aboard ship, but has no personnel afloat to follow things up, cannot go unchallenged. From this statement one is led to believe that all bureaus, other than the Bureau of Construction and Repair, have personnel aboard ships of the Navy who are responsible directly to these bureaus for the material under their cognizance. I do not believe that such is either the fact or the intent. It has

always been my understanding that all officers and men are working for the best interests of the Navy as a whole and not for any particular bureau of the Navy Department. The fact that there is no commissioned officer of the Construction Corps at present on board each battleship should be no reason why the Construction and Repair Department of the ship should not function within the requirements and limitations of the bureau's manual. I believe that line officers are fully as capable of administering this department as efficiently as any member of the Construction Corps. I wonder if Lieutenant Commander De Treville would have us believe that the Engineer Department of a battleship would cease to function efficiently if the chief engineer did not happen to be an officer restricted to "engineering duty only," as "E.D.O.'s" are the only line officers that can in any sense be considered as Bureau of Engineering personnel.

On the other hand, if the above premise is wrong and if the gunnery officer is considered as the representative of the Bureau of Ordnance, the navigator the representative of the Bureau of Navigation, and the engineer officer the representative of the Bureau of Engineering, why shouldn't the first lieutenant be considered the representative of the Bureau of Construction and Repair? There is no reason why a line officer should not represent the Bureau of Construction and Repair aboard ship inasmuch as the personnel of the bureau in Washington is not confined to members of the Construction Corps. An examination of the personnel of the bureau will reveal the fact that there are line officers always on duty there. The Bureau of Construction and Repair is not so hidebound as to believe that only naval constructors can represent it; witness the inspection of material under the bureau's cognizance by the various inspectors of naval material, many of whom are line officers.

It is believed that the first lieutenant is as fully capable of administering his department within the requirements of the Bureau of Construction and Repair Manual as the engineer officer is of keeping within the requirements of the Bureau of Engineering Manual. It is not claimed for one instant that the Bureau of Construction and Repair Manual is perfect, for after all it is a man-made article. The requirements of the manual were arrived at only after much research and many tests and after the consideration of thousands of recommendations from the forces afloat. It isn't a one-man book, but represents the best that the bureau, by tapping all sources, has been able to find. It is just as easy for the forces afloat to play the game within the rules as set down in the manual as it is to violate them. Anyone can cheat at solitaire, but playing the game under such conditions is a hollow satisfaction.

Now let us consider Lieutenant Commander De Treville's recommendations for a solution of the first lieutenant's troubles. One of his suggestions, of course, would solve all of the troubles of that head of department, namely, if we went back to the ancient system whereby the executive officer performed almost all of the duties for which the first lieutenant is now responsible. This solution is nothing more than the old game of passing the buck. Abolishing the first lieutenant and creating an inspection officer as an aide to the executive officer for inspection duty only, with no authority to get results accomplished, is only introducing an idle wheel into the organization. Under the present organization, what is the first lieutenant but an aide to the executive officer? The executive officer is the second in command and as such should be the coördinator under the commanding officer of all of the ship's departments, the heads of the various departments being his aides in making the organization of the ship as a whole function efficiently. I agree thoroughly that at present the executive officer of a capital ship is a very much overworked individual. Under present conditions there are hardly enough hours in the day for him to attend to his multitudinous duties. Lieutenant Commander De Treville's suggestion that the executive officer be given an aide to care for the paper work of his office is an admirable one. The assignment of a senior lieutenant or a junior lieutenant commander to this position would greatly relieve the executive officer and allow him much more time to stay out of the swivel chair and personally supervise the actual running of the remainder of the ship. With the executive officer relieved to

a great extent of his office duties, the first lieutenant's job should be much easier. He would then have greater opportunity of actually pointing out to the executive officer what is wrong and what is needed to remedy the defects, rather than having to report conditions verbally, at a time when more than likely the executive officer's mind is occupied with some other problem.

The question of cognizance of material aboard ship, as everyone knows, is a very involved one, and I don't believe that anyone can be found who can really defend the present system or who would maintain that it is by any stretch of the imagination logical in all of its particulars. Bureau cognizance is intimately connected with the congressional method of appropriations for the Navy and cannot be sweepingly changed by any administrative action. All machinery cannot be shifted by order from the cognizance of the Bureau of Construction and Repair to the cognizance of the Bureau of Engineering. Such a change in cognizance would require a change in the basic law, but there is no reason why the desired result should not be achieved aboard ship. If it is considered best for the efficient operation of the ship as a whole, there is no earthly reason why *all* machinery now under the cognizance of Construction and Repair, Engineering, and Ordnance should not be placed under the engineer officer insofar as maintenance and upkeep are concerned.

If the above is the desired result, it is suggested that the responsibility for the maintenance and upkeep of all machinery aboard ship be placed under an officer of considerable experience of the Engineer Department, possibly the senior assistant to the engineer officer, who should be called the repair officer. If a repair department as an auxiliary to the engineer department were established aboard ship, I believe that all repairs made by the ship's force would be more expeditiously accomplished. Any and all repairs in all departments, other than cleaning and painting of the actual ship structure, would be made the subject of a written request on the repair department. If such a department were established, it would be necessary, of course, to assign to it the proper number of qualified commissioned and warrant assistants in addition to *all* of the strictly mechanical ratings among the enlisted complement. The establishment of such a repair department would probably also increase the work of the accounting section of the supply department, as it would be necessary for the supply officer to furnish the various heads of departments monthly, or more often upon request, the status of their various allotments.

In conclusion, I believe that there is a real rather than an apparent need for an experienced officer in the position of first lieutenant as head of the Construction and Repair Department of all capital ships, whether the officer occupying the position is either a line officer or a naval constructor. The abolishment of the position of first lieutenant as an independent head of department and the creation of a purely inspection officer with no authority would certainly not solve the problem and would be a step in the wrong direction. It seems to me that it makes not the slightest difference whether the first lieutenant of a capital ship is a line officer or a naval constructor. I cannot subscribe to Captain Howard's statement that the assignment of a naval constructor to the first lieutenant's job would be the injection of an officer with no military authority into the ship's organization. I understand the restriction placed against staff officers, whereby they are prohibited from the exercise of command afloat, to mean that staff officers cannot command a naval vessel, not that they cannot exercise command and military authority over component parts of a vessel or over members of the ship's complement. Certainly there are at the present time members of the Supply Corps and the Medical Corps serving afloat who exercise military command within their respective departments. Personally I feel that a commission as a naval constructor is more than sufficient authority for any member of the Construction Corps with *sufficient* experience, to efficiently fill the bill as the first lieutenant of a capital ship.

The Value of Engineering Competition

(See page 33, January, 1930, PROCEEDINGS)

LIEUTENANT COMMANDER T. L. GATCH, *U. S. Navy.*—It seems to be the fate of mankind that when something new is started, be it material or personnel, it rapidly becomes complicated. More and more things are de-

sired and are seen to be possible, so more and more complications are added to accomplish this. Thus it continues through some years; then comes more thorough understanding, clarification, simplification. As an illustration—the modern breech mechanism.

Despite what may be thought of the engineering competition—and some of us when we see seamanship sacrificed to the Moloch of score, or see ships steam at good scoring but actually uneconomical speeds, think pretty strongly on that point—the fact remains that it has unquestionably done a great deal of good. Can this good be retained and the features that irk be discarded?

Lieutenant Commander Weber in his excellent article cites the interesting case of the *Oklahoma*. To show that she continued to improve in engineering despite losing the white "E," he inserts a table (top of page 34 of the PROCEEDINGS) making a comparison with past performances by years. There is no question that this table proves his point. Such a table for another ship would show whether she was steaming better or worse than she had been. What fairer criterion could be asked? The very method that an engineer uses to prove that his plant is operating more efficiently is the method on which the competition should be based.

The ship that won the competition any one year would be the ship that had during that year improved the most on her past performances. This improved yearly performance would then become the new standard. Clarification, in that the competition would be based directly on improving the performance of one's own plant; simplification, in that about 90 per cent of the bookkeeping now required would be eliminated.

One detail not shown in Lieutenant Commander Weber's table should be added for fairness. To illustrate: the total miles steamed during the year or month should be divided by the total number of hours under way, thus getting the average speed. One month a ship might steam 2,000 miles at an average speed of ten knots, and the next month steam the same distance at an average speed of twelve knots. An allowance should rectify this, and such an allowance is the only allowance that need enter into the competition at all. The tendency of the ships should be to steam at actual economical speed.

Reliability should of course be a consideration. The present method of penalties is fair and simple.

Credit might also be given for short time needed at a navy yard, as shown in Lieutenant Commander Weber's table, but this time is often determined by other than engineering overhaul, and the added complication more than offsets the value of this feature. For, after all, a ship that improves is not going to need extensive overhaul properly chargeable to operation.

The case of a ship first commissioned presents some unavoidable complications. Such a ship cannot fairly compete until after the end of the first complete competition year from her first commissioning; for there will be no past performances by which to judge her. Moreover such a ship would naturally improve more rapidly during her first ten years of service than she will later on, or than an older ship of her type can. This feature will have to be worked out arbitrarily. However, all told, at least the greater part of the present arbitrariness of the competition will be eliminated.

We all know that the pen is mightier than the sword. Is the adding machine mightier than the main engines?

PROFESSIONAL NOTES

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LIEUTENANT COMMANDER D. C. RAMSEY, U. S. NAVY
AND
PROFESSOR HENRY BLUESTONE, U. S. NAVAL ACADEMY

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UNITED STATES

The New Lake-Class Cutters

Nautical Gazette, Feb. 15, by Capt. R. B. Adams, Engineer-in-Chief, United States Coast Guard.—The new Coast Guard cutters, *Itasca, Sebago, Saranac* and No. 53, yet to be named, are now being constructed at the yards of the General Engineering Company, at Oakland, Calif. These vessels are similar, as far as the hull is concerned, to the five cutters of the *Chelan* class recently built by the Bethlehem Shipbuilding Company at their Fore River works, but some changes have been made in the machinery installation. The vessels are 250 feet long with a 42-foot beam, 16-foot draft, and a displacement of about 1,800 tons. A single mast placed between the pilot house and the smokestack gives a clear arc of fire for the three 5-inch guns and provides a clear deck aft for transportation and operation of planes in case of necessity. The *Chelan* class exceeded 17 knots on their trial trips, and it is expected that these new cutters will equal this speed.

The propelling machinery will be of the standard Coast Guard turbo-electric drive of the synchronous motor type designed and constructed by the Westinghouse Electric and Manufacturing Company. This type electric drive was conceived by the Coast Guard and developed in conjunction with the General Electric Company and was first installed in the *Modoc* class. This was the first synchronous motor drive developed for marine propulsion. The *Modoc* has cruised approximately 180,000 miles since being commissioned, has been a satisfactory vessel in every respect, and the cost of upkeep of the propelling machinery has been negligible.

The main turbine generator set will consist of an impulse reaction turbine suitable for operation with 260 pounds of steam and 175 degrees F. super-heat, with 28½ inches of vacuum driving a 3-phase, 60-cycle, 2-pole generator through a solid coupling.

The rotor will be one solid forging of annealed carbon steel machined over its entire surface and designed to receive two rows of impulse blading and twenty-two rows of reaction blading of stainless steel, Monel metal being used for the stationary blades. The steam chest will be of the 4-valve automatic type, each of the four groups of nozzles having a separate valve, and these valves are operated by the governor mechanism which controls the turbine speed. This governor will be of the oil impeller type, the impeller being mounted on the turbine rotor and oil is supplied to its suction side at approximately 20 pounds pressure from a separate motor-driven oil pump. This impeller increases or decreases the applied oil pressure acting on the steam valves through the governor mechanism, thus controlling the turbine speed.

The turbine will be fitted with two throttle valve trip mechanisms, one affording protection by automatically shutting down the turbine if the bearing oil pressure becomes too low, the other an over-speed governor mounted on the end of the turbine rotor spindle will trip the automatic valve if the turbine speed reaches 10 per cent above normal speed. This over-speed governor will also be provided with a safety device for closing the throttle valve in case of excess axial travel of the rotor. The specifications covering the turbine provide for two bleeder connections cast on the turbine casing to extract steam for heating feed water, located on such belts as will afford 10 pounds pressure at full speed and at three-quarters speed, respectively, when bleeding approximately 3,000 pounds of steam per hour.

The main condenser will be of the surface, 2-pass type, having approximately 3,600 square feet of cooling surface or sufficient to handle exhaust steam when the cooling water is 70 degrees F. and back pressure at turbine trunk 1½ inches. The tubes will be ⅝-inch outside diameter, .049-inch thick, Admiralty metal. The tube sheets will be of rolled navy brass 1⅛ inches thick.

The main generator will be of the revolving field type with an output of 2,600 kw. at 3,600 r.p.m., 2,300 volts. The manufacturers guarantee this rating will be carried continuously without exceeding a temperature rise of 85 degrees C. on the rotor and 60 degrees C. on the stator, based on 40 degrees C. ambient air temperature. Stator and rotor are similar in design to those of the main generator in the *Chelan*, having the same type ventilating fans mounted on the rotor drawing air from both ends of the generator from underneath and discharging through an air duct to the deck above.

The propulsion motor will be of the revolving field, salient pole, synchronous type,

the rating being 3,220 horsepower, 3-phase, 60 cycles, 44 poles, 165.5 r.p.m., 2,300 volts. The motor is guaranteed to carry this load without exceeding 50 degrees C. rise on the rotor or stator under ordinary conditions.

From squirrel-caged windings, dove-tailed in the faces of the pole pieces, the starting characteristics of an induction motor, sufficient for maneuvering at 15 cycles, will be obtained. Ventilation for this motor will be obtained by an A.C. motor-driven exhaust fan of the Westinghouse propeller type. This ventilating set is installed within the duct from the motor and this duct is designed on the principle of a converging diverging nozzle with vanes to provide for the proper discharge of air from the fan.

The line shaft will be 12 inches in diameter, the propeller shaft 13 inches. The thrust bearing will be a Kingsbury, 3-shoe, 25-inch Style H. S.S. bearing. The propeller will be of manganese bronze, right-handed, 4-bladed, solid, and will be machined and accurately balanced. It will be 11 feet 9 inches in diameter, 11 feet 6 inches pitch, and will rake aft 18 inches. The areas will be as follows: projected area, 43.34 square feet; developed area, 49.50 square feet; and the disc area, 108.4 square feet.

The control for the propelling equipment will be arranged in a unit group. There are three levers for speed control, direction of motor rotation and excitation, all suitably interlocked to prevent improper operation. Interlocks will be provided so these screens cannot be opened until the main generator field has been killed. Provision will be made so that the propeller may be operated continuously from 45 to 163.5 r.p.m. and the designed normal hold in torque is 120 per cent with a momentary hold in of 145 per cent.

Electric current for auxiliary power, excitation, and lighting will be furnished by four generating sets, three turbine driven and one driven by an A.C. induction motor. Two of these sets are of the 3-unit type consisting of a turbine, gear, direct-current 3-wire generator and an alternating-current generator, all mounted on the same bed. The turbine will be the Westinghouse type 5HNC 6,600 r.p.m., operated under 250 pounds gage pressure, 175 degrees super-heat, and will be designed to carry half load when exhausting to the atmosphere. The direct-current generator will be rated 240/120 volts, 1,200 r.p.m., and will be shunt wound. This generator will supply current only for excitation to the generator and main motor. The A.C. generator will be rated 187½ kva., 240 volts, 80 per cent power factor, 1,200 r.p.m., 3-phase, 60 cycles and will supply all current for motor-driven auxiliaries and for lighting.

There will be no D.C. motors on these vessels, and all lights except searchlights will have A.C. current. These three unit sets differ from the sets on the *Chelan* where there are both D.C. and A.C. motor-driven auxiliaries and the lighting is D.C. On that class we have a turbine, gear, A.C. motor generator and a D.C. generator. When maneuvering, or when the main generator frequency is below 40 cycles, the turbine carried the load, but the A.C. motor generator can be synchronized with the main generator when the frequency is above 40 cycles, the turbine cut out by an oil governor that closes the throttle valve, and the main generating set made to carry the entire electrical load of the ship. This hook-up is more economical than the arrangement on the *Itasca*, as the main turbine water rate is around 9.25 pounds per horsepower, while the turbine driving the auxiliary 3-unit set is rated at 26.5 pounds. The only objection to the *Chelan* arrangement is the automatic devices that must function when the auxiliary motor generator is synchronized. For port use there will be a geared turbine driving a 62½ kva., 240-volt, 3-phase, 60-cycle A.C. generator at 1,200 r.p.m. The generator for the excitation will be coupled to the A.C. generator shaft. The motor generator set used for furnishing current for the arc searchlights will consist of a 25-h.p., A.C., drip-proof motor directly connected to a 50/120-volt shunt wound D.C. generator. This machine will operate at 1,750 r.p.m.

"V-6" To Be Launched

Baltimore *Sun*, Feb. 23.—The largest submarine ever built by the United States will scorch down the ways at Mare Island navy yard, March 15.

The *V-6* and its sister-ship, the *V-5*, now under construction at Portsmouth navy yard, will have a cruising radius of 20,000 miles and be among the largest yet laid down by any nation.

They are designed for extended operations in distant waters if need arises.

At the same yard twenty days later the cruiser *Chicago*, sixth of eight cruisers of the maximum armament allowed by the Washington Naval Conference of 1922, will take the water.

Size of the *V-6* is designed to enable it to achieve the maximum of reliability on long journeys in which the endurance of the crew is measured to a considerable extent by the physical comforts which can be provided. It is the sixth of nine undersea craft allowed under the Washington pact.

The first three V-types built were designed for speed, while the *V-4* is a mine layer. The last three of the nine will differ from the *V-5* and *V-6* in size and cruising radius, all probably smaller.

The new under-water fighter at Mare Island is 371 feet long, has a displacement of 2,760 tons, exclusive of fuel oil, and two deck guns.

Latest safety devices for escape while under water have been incorporated, as well as a disappearing radio antenna. Eight officers and eighty men will comprise the crew.

GREAT BRITAIN

Trials of the "Anthony"

London *Times*, Feb. 11.—The new destroyer *Anthony*, built by Scotts' Shipbuilding and Engineering Company, Ltd., Greenock, has completed her trials, and will be handed over in the course of a few days. A navigating party from Chatham will join her on Thursday. She is one of the first post-war group of the replacement destroyers, ordered under the 1927 program, and is 312 feet long by 32¼ foot beam, with a mean draught of 8½ feet. The displacement is 1,330 tons, and the armament four 4.7-inch guns, seven smaller guns, and eight torpedo tubes. The propelling machinery consists of Parsons turbines working through single reduction gearing to the propellers, which turn at 360 revolutions a minute when full power is being developed. Superheated steam is supplied from three express-type Yarrow boilers working under forced draught.

The *Anthony* carried out an exhaustive series of measured water and fuel consumption tests, which revealed a high level of overall efficiency. Her average speed on a six hours' full-power trial was 36.301 knots, with the engines developing slightly over the contract shaft horsepower of 34,000. The designed speed was 35 knots. No attempt was made to exceed by forcing, as this is not the purpose of British Admiralty trials. A sister-ship, H.M.S. *Ardent*, is nearing completion in Messrs. Scotts' yard.

New Sloops

Naval and Military Record, Feb. 12.—Since last July there have been under construction in the shallow dock at Devonport South Dockyard two sloops named the *Penzance* and *Hastings*. They belong to a class of vessels all of which are to bear the names of seaports. So far as is known, these are the first naval vessels to be built in dock at Devonport, and the day on which the dock is flooded and the new sloops are put afloat in March will therefore be unique in the history of the yard.

The event will take the place of launching in the case of a ship built on a slip, and will be marked by a ceremony, but this will be quite simple and private.

In the meantime, preparations are being made for the laying down of another sloop, for which the name *Fowey* has been selected. This vessel is to be built on No. 4 slip at the south yard. This is the slip on which were built the battleships *Ocean, Implacable, Bulwark*, and other vessels, whose construction marked the opening of what came to be known as the battleship-building era for the Devonport establishment about thirty years ago.

As already announced by the First Lord of the Admiralty, another sloop retained in the 1929 program of new construction has been allocated to the Devonport yard. It is expected that this vessel will be built on a slip.

The new cruiser which has been saved from the reduced program will be built on the slip from which the cruiser *Exeter* was launched by Lady Madden last July.

Launch of the Sloop "Folkstone"

London *Times*, Feb. 11.—H.M.S. *Folkstone* is to be launched at 2:15 P.M. today without ceremony at the yard of Swan, Hunter and Wigham Richardson, Ltd. The *Folkstone* is the first of the four sloops of the 1928 program to take the water. She will be of 1,040 tons, 2,000 horsepower, 16-16½ knots speed, with geared turbines us-

ing oil fuel only, and will be armed with two 4-inch and some smaller guns. The utility of the sloop class during the war led to their retention in the post-war Navy, where they have proved their value in many ways both at home and abroad. Messrs. Swan, Hunter and their associated firms have been very successful with this type of craft, of which they have turned out some 55 vessels for our own and foreign governments. The propelling machinery and water-tube boilers of the *Folkstone* are being built by Hawthorne, Leslie and Co., Newcastle-on-Tyne. There will be installed two sets of steam turbines, each comprising a high-pressure and a low-pressure turbine with single reduction gears.

The name *Folkstone* has been borne by various small craft in the Royal Navy since about 1727, but there is not much history attaching to it. The last was a South-Eastern and Chatham Railway steamer taken up during the war and used as a mine sweeper. In 1914, Admiral Jellicoe found that, useful as the mine sweeping trawlers were, their speed was too low to allow them to work far enough afield to give him elbow room. Until specially constructed vessels could be built, the Admiralty utilized eight fast railway packets, of which the *Folkstone* was one. She remained in service all through the war.

FRANCE

Destroyer's Record

Naval and Military Record, Jan. 29.—The French destroyer *Valmy*, which left Lorient today for Egypt, set up what is claimed to be a new world's record by achieving a speed of 39.85 knots (over 45 miles an hour). The previous record was held by the French destroyer *Verdun*.

The *Valmy* will represent France at Ismailia, where the celebrations of the war-time defense of the Suez Canal are being held.

Training Ship Launched

New York *Times*, Feb. 15.—The French training ship, the cruiser *Jeanne d'Arc*, was launched at St. Lazaire today in the presence of high government and navy officials and a large crowd of spectators.

The Minister of Marine, Georges Leygues, who was scheduled to preside, was detained in London by the Naval Arms Conference. Mme. Leygues, however, went from London to attend the ceremonies, and she cut the ribbon which set the vessel in motion.

The *Jeanne d'Arc* is of 6,600 tons displacement and will be equipped as a model training cruiser. She is 106 meters in length and has an estimated speed of 25 knots. She is armed with four turrets, each with two 155 mm. guns, four "75" cannons, two anti-aircraft of 37½ mm., and two single torpedo tubes.

GERMANY

German Bid for Sea Power

Naval and Military Record, Jan. 29.—French officers *de vaisseau* who, on different occasions and in various circumstances, had opportunities of closely examining the new German Navy, do not conceal their admiration for material, personnel, spirit, and training methods. Outwardly, it is a force of secondary importance for those who view fleets from their paper value, whereas in reality it is, man for man and ship for ship, the most up-to-date striking force in existence, and the one also most deeply animated with an indomitable will of offensive *à outrance* to extend over the whole globe and to utilize every available means of warfare.

A bright and genial officer of the Imperial Republican fleet declared:

> In the last, or, rather, latest tussle, our great mistake was to underestimate the capabilities of sea power and to imagine that the issue depended solely upon the Army. Had we known what we know today, luck would have stayed with us all through. The crime was to keep the ships in harbor, waiting for some miracle to be accomplished elsewhere, when the miracle and the key of victory were within our reach at sea. There is not a German boy who does not realize so much today. We were under the delusion that the British were better than ourselves, and a feeling like that nips initiative in the very bud, of course. True, English fleet seamen are fine chaps—proud beggars, too; but today our professional *matrosen* have nothing to envy any seamen in the world; they are the pick of the manhood of their great country. We can select them; we have the choice, and plentiful. France in no way can compete; Great Britain not quite. We make them like the sea and like their job, and like what eventually it might mean to them. As for spirit and national pride, well, they have only, to feel their chests bucking up, to look at the names of our new ships. They tell of the greatest, longest stand-up fight made against overwhelming odds under modern conditions. In truth, the British and the German are the only fleets that have fully "faced the music" with the new weapons, the weapons of yesterday, I mean! As to ocean bases, points *d'appui*, and

the like, their absolute necessity is not so evident as formerly; warships are not, as formerly, tied to coaling stations, especially when backed by friendly sea tramps and air tramps, too, and other merchant craft—so far as the term merchant may outlive the next declaration of war.

Not without misgivings, French observers in Germany note the powerful and unanimous national impulse that is backing the new maritime rise of the fatherland. The nominal introduction of democratic institutions in the working of the state has left unimpaired the efficiency of the Navy and Army Departments and staffs created under the Kaisers and unimpaired also the scientific research organization that was the pride of Germany before the war and is yet an asset of superiority over all comers. Technically, Germans lead in practically every branch that makes for fighting excellence. The bold designs of the *Bremen* and *Europa* liners and of the new battleships and cruisers, the astounding transformation of the *Columbus* and *Ballin* class liners, the success in all countries of German motors and propelling devices, especially the M.A.N. and Bauer-Wach (exhaust turbines). The giant Dorniers and Junkers seaplanes and the world-famed *Graf Zeppelins* tell their own tale, without mentioning the ominous lead Germany is asserting and strengthening in the output of chemical and other "agricultural" products. Intense naval and colonial propaganda is turning the minds of young and pushful Germany towards the sea and distant ventures. Those "writings on the wall" are thought by some to be deserving of some notice at the moment when, in London, praiseworthy attempts are being made at settling the fate of this globe by means of eloquence and "scraps of paper." In the making of the future "defeated" but superiorly organized Germany is strenuously preparing to have a say, and at her own time, acting while others do the talking.

ENGINEERING AND RADIO

Magnetic Storm Worse Than Static

Baltimore *Sun*, March 2.—An enemy more difficult to cope with than static confronts radio engineers when they venture into the field of international program exchanges, according to C. W. Horn, general engineer of the National Broadcasting Company. The new enemy is the so-called magnetic storm, an effect known to electrical engineers for years. Mr. Horn said:

> We have known for many years that the magnetic storms affect landline communications to quite an extent and influence delicate instruments, such as ships' compasses. However, it is only in recent years, since the advent of long-distance radio communication, particularly on short waves, that we have noticed any great effect from this source.
>
> It is a peculiar fact that the magnetic disturbances act differently in the case of long waves. Dr. L. W. Austin, of the Bureau of Standards, who has been making measurements for many years on long waves, reports a general increase in signal strength at about the time that magnetic disturbances take place.
>
> We have found that these disturbances react in just the opposite manner on short waves. That is, they reduce the signal strength very greatly and seem to offer impedance to the passage of the wave.

The uncertainty as to when magnetic storms may be expected makes it difficult to plan transatlantic program exchanges in advance, Horn explained. Twice last week the National Broadcasting Company's attempts to relay European programs in this country were defeated by magnetic storms, which attacked the programs coming from England and Germany and made it impossible to pick them up on this side of the ocean.

Static is an enemy which engineers believe can be partially conquered. Static does not reduce the strength of the signals, but is an interference, manifesting itself in the form of noise. It is conceivable that programs might be broadcast at such high power that the interference from static might be reduced to a point where it would not be objectionable. In other words, static might not be eliminated, but it might possibly be weak in ratio compared with the signal strength.

No one really knows much about the causes of magnetic storms, according to Horn, but there seems to be a general belief among scientists that the sun spots, of which so much has been heard in the last few years, are responsible to a large degree.

During the last several years, during which very high sun-spot activity has been noticed, there has also been a large number of these magnetic storms. Astronomers' records, according to Horn, show that the periods of greatest sun-spot activity evidently run in cycles of approximately eleven years.

The activity is now on the decline, and for the next five or six years improved conditions in radio reception are to be expected. Horn said:

> This gives us a great deal of hope, and a breathing spell during which scientists and engineers will actively pursue their investigations, and perhaps find a way of overcoming some of nature's eccentric and irresponsible behavior.

MERCHANT MARINE

Our Maritime Future

Marine Journal, Feb., by Hutchinson I. Cone, Commissioner, United States Shipping Board.—About a year ago I was asked to make a brief statement concerning the future of the American Merchant Marine, to which I replied: "We are on the threshold of a recrudescence of the nationalistic spirit of shipmindedness which prevailed in the first half of the nineteenth century and resulted in the glorious achievements of that period."

Today we have crossed the threshold and are well into a new era in shipping and shipbuilding activities and at no time in the history of our country has the future for these industries appeared brighter.

How has this all come about after a half century of neglect and indifference on the part of the American people toward their national shipping?

The story of the decline of American shipping in foreign trade is too well known to repeat here. Suffice it to say that for ten years prior to the World War only 10 per cent of our total water-borne foreign trade was carried in American ships.

At the beginning of the World War, in the summer of 1914, a large number of the foreign flag ships which had been carrying 90 per cent of our commerce were withdrawn without notice to serve the urgent needs of the belligerent countries and the flow of our foreign commerce was seriously impeded, resulting in incalculable losses to industry and agriculture.

The American people were brought to a realization of the fact that American flag ships were indispensable for the proper carrying-on of the nation's business and, when we finally became involved in the war, we found that American flag ships were not only necessary to insure the uninterrupted flow of the nation's commerce but were vitally essential as auxiliaries to the navy. We were deplorably deficient in ships for both purposes.

The theory propounded by short-sighted economists to "let the nations carry our commerce who can carry it cheapest" proved definitely and conclusively to be an economic fallacy.

The tremendous losses suffered by American industry and agriculture before our entry into the World War and the stupendous sum expended during the war in the feverish haste to produce ships would have been sufficient, if constructively and progressively expended, to have aided American shipping to overcome for the next 150 years the economic handicaps resulting from our higher living standards.

Of interest to us at this time is the progress made and the future of American shipping. In the liquidation program of the United States government in its shipping activities, attention is invited to the extent to which it became involved in the shipping business.

The United States Shipping Board had under its jurisdiction at one time in ships contracted for, requisitioned, commandeered, chartered, purchased, seized and transferred, over 4,500 ships of 17½ million gross tons. The significance of these figures can only be appreciated when it is pointed out that in the midsummer of 1914, at the beginning of the World War, the principal sea tonnage of the world totaled 8,400 ships of 35 million gross tons.

In other words, the United States government through its agency, the United States Shipping Board, had in two years acquired and contracted for a fleet of ships totaling more than half in both numbers and tons of the total sea tonnage of the globe at the time of the outbreak of the World War.

World shipping conditions, at the time the Shipping Board set out to establish and inaugurate essential services in the world's trade routes, were at a very low ebb and with a decidedly dismal outlook.

The break in the freight market which began in 1920 was still on a downward trend and between 10 and 12 million gross tons of ships throughout the world were laid up for lack of cargoes.

These were the conditions which prevailed when the board began carrying out the provisions in the Merchant Marine Act of 1920, to put our fleet of ships to work.

Fifty-two passenger and cargo services were inaugurated by the board. By consolidations and sales to private American operators, the lines have been disposed of until today there are but eighteen cargo lines remaining under the supervision of the board. The fleet has been reduced to 488 ships of 2,657,000 gross tons, of which 230 ships of 1,372,000 gross tons are in active operation and the prospects are that the bulk of these will soon be sold to private operators.

Considering the conditions prevailing at the time we started to inaugurate and establish services in the world's trade routes, it is well to remember that we were in competition with maritime nations having the knowledge and mechanism of a successful background of maritime service, and during the period of reëstablishing ourselves on the seas the nations with whom we were competing had the additional advantage of having modern seagoing ships at their disposal, of which ten million gross tons were constructed during the past eight years.

Much constructive work has been accomplished despite our many handicaps. It is gratifying to know that we have increased the carriage of American commerce in American ships materially during the past ten years, during which time commerce carried in American ships has averaged 36 per cent as against an annual average of 10 per cent for the ten years prior to 1914.

This gain is the more significant when it is considered that the value of our foreign water-borne commerce for the past ten years has averaged $2,600,000,000 as against an average of $300,000,000 for the decade prior to 1914.

It is obvious that the establishment of American flag services has contributed materially to the expansion of our foreign trade.

In 1914 there were engaged in the European trade 6 American flag ships of approximately 70,000 gross tons. Today, 233 American flag vessels of nearly 1,500,000 gross tons are employed in the European trade. There were 5 American ships of about 23,000 tons engaged in the trade between the United States and South America. Today, we have 90 ships of 550,000 tons in the same trade. We had one line operating 5 ships of 55,000 tons from Pacific coast ports to Asia under the American flag. Today, we have 140 ships of 1,000,000 tons in the trade with Asia. We had no services to the African continent in 1914. Today, we have 22 ships of 125,000 tons.

The trade of these areas shows a marked expansion over the pre-war period. The increase with Europe over 1914, amounts to 50 per cent, with South America 200 per cent, with Africa 325 per cent, and with Asia 380 per cent.

At the present time the ocean-going American merchant fleet in established lines in foreign and non-contiguous trades consists of 671 vessels of 3,865,000 gross tons. This shows a 500 per cent increase in numbers and nearly 550 per cent in tonnage since 1914. With few exceptions these vessels are of 2,000 gross tons and over and 60 per cent of the number and 65 per cent of the gross tonnage are now under private ownership.

It is a certainty, however, that without the strong support of the government our merchant marine would have reverted to the humiliating and, from the standpoint of the nation's welfare and security, economically unsound position it occupied before the war.

As a result of the Merchant Marine Act of 1926, contracts have been awarded for the building of 17 new vessels totaling nearly 70 million dollars. Plans will be under way shortly for the building of additional ships as required under the mail contracts to be awarded, making a total of about 50 ships, valued at approximately 235 million dollars; most of which are to be built within the next five years. These ships will all be of the most modern types and comparable to any in the world.

The expressed purpose of the Shipping Act of 1916, was the "development and encouragement" of our merchant marine; that of the Mercant Marine Act of 1920, the "promotion and maintenance" of our merchant marine; and that of the Merchant Marine Act of 1928, the "further development and permanence" of our merchant marine.

The Congress and people of the United States have thus demonstrated their firm determination that American flag ships shall again handle a proper portion of our traffic and be sufficient in numbers and adequate in tonnage and speed to insure the uninterrupted flow of our commerce to and from the markets of the world and to serve as an efficient naval auxiliary in time of national emergency.

In the face of constant—and sometimes non-constructive—criticism the Shipping Board has tenaciously and courageously pursued this maritime mandate of the American people, and, as results are now proving, has so firmly established and so well maintained the essential arteries of commerce under the American flag—that it is but a matter of a short time until American flag ships will again occupy, under private American ownership, their rightful position on the seas.

The substantial progress so far made in this direction is, in itself, a tribute to the initiative and coöperation of the private American shipowners and operators who have worked hand in hand with the government to reach this goal.

There is every justification for feeling optimistic about the future of our merchant marine.

AVIATION

Flight Surgeons in the Army Air Corps

New York *Herald Tribune*, Feb. 2.—The necessity of looking after the physical and mental welfare of fliers to avoid airplane accidents caused by the human element, has resulted in the establishment of a division of aviation medicine in the office of the chief of the Army Air Corps.

The War Department announced today that sixty flight surgeons have finished at the recently established School of Aviation Medicine at Brooks Field, San Antonio, Texas. These graduates are stationed at army flying fields and in the overseas department.

Recently published statistics, the department said, have shown that 59 per cent of the accidents in commercial flying, 63 per cent in the Army and 74 per cent in the Navy are due to failure of the pilot and the human element. While there has been a steady decrease in flying casualties, it was reported there had been no decrease in the casualties due to failures of pilots.

British Influence in Flying Boat Development

Baltimore *Sun*, Feb. 9.—The new British flying boats now building are of the most advanced and modern design, with a range with full useful load of 2,500 miles, according to Major Oliver Stewart, aviation correspondent of the London *Morning Post*. This is the only performance figure cabled to this country in connection with Major Stewart's claim for the supremacy of British naval aviation in 1930, but it is enough to silence any contradictory claims which might arise here. We have no flying boats with such a working range.

That British airplane designers have advanced so far is due altogether to the foresight of Sir Hugh Trenchard, marshal of the Royal Air Force, who retired as chief of the Air Staff on December 31 after holding the position since 1919. Under his leadership the Royal Air Force recovered from the after-the-war slump, designers and manufacturers were encouraged, the effort of the Admiralty to have the force dissolved into its original components so that the seagoing side might be returned to the Navy was defeated and funds were secured from a reluctant Parliament for further development, with the result that Britain now holds the world's records for speed, having twice won the Schneider trophy races and has produced a long-range airplane the equal to any, not to mention her new military flying boats.

England undoubtedly was the first to recognize the value and possibilities of the flying boat and to urge development of this type, long in disfavor because of its low disposable pay load per mile per hour per horsepower. In the beginning constructional difficulties, brought about by the lack of materials possessing both strength and lightness, caused a drift to other more efficient types of planes and so the development of the flying boat lapsed. Then came the perfection of dural, a light metal of strength, and constructional features made possible by the use of the new metal opened up a new world for the flying boat. Now it is possible to build a flying boat the equal of any landplane in efficiency. And in addition the flying boat retains the old advantage accruing to it by virtue of the fact that two-thirds of the earth's surface is covered by water.

But in America the Navy has launched a movement for a new type of flying boat of which much is expected. The new boats are still on paper, of course, but a year and a half should see this country providing some very interesting competition.

Faster Planes for Navy

New York *Times*, Feb. 9.—The Navy Department has taken steps which indicate that naval aviation chiefs are planning an inten-

sive program aimed at increasing the speed of planes.

The Curtiss-Wright Corporation has been commissioned to draft plans involving, it is understood, the development of new high-power, lightweight engines, more efficient planes, adequate fuels, propellers, and other accessories for high-speed flight. An appropriation of $25,000 was allotted for the expense of conducting the survey.

This move, coming soon after the apparently successful development of a 200-mile-an-hour fighting plane, is taken here to indicate that the Navy will attempt to parallel the accomplishments of the British Royal Air Force of Great Britain, which already has in operation fighting planes with speeds of 220 miles an hour.

The survey to be undertaken by Curtiss-Wright engineers, it is understood, is not aimed at the development of racing airplanes and engines, but at the building of faster fighting craft. The lack of the development of such planes in this country was emphasized in a radio address here last night by F. Trubee Davison, Assistant Secretary of War for Aëronautics.

Until tests were completed during the last ten days at Wright Field, the headquarters of the Army Air Corps' material division, near Dayton, Ohio, no United States manufacturer had succeeded in building a military-type plane capable of a speed of 200 miles an hour.

A Boeing fighting plane, equipped with a Wasp motor and Venturi cowling, in tests at Wright Field which have just been completed, maintained an average of 196 miles an hour when flown by nine different pilots and reached a top speed of between 205 and 206 miles an hour. A plane of somewhat similar design manufactured by the Curtiss Aeroplane and Motor Company is understood to be capable of a similar performance.

Even better results, it is said, are expected from a new Boeing high-wing monoplane, which had its first flight test yesterday at the plant of the Boeing Airplane Company at Seattle, Washington. This plane is expected to have a speed in excess of 220 miles an hour, although officials of the Boeing company have declined to discuss its possibilities until the tests have been completed. It is to be brought to the naval air station here within a short time.

One of the most powerful airplane motors now produced in this country is the Curtiss Conqueror, which has a rating of 625 horsepower.

The Navy's program for the development of planes of higher speeds than those now available would require the production of engines of greater power and efficiency than those now available and paralleling in performance those used in the new British fighting planes and in similar craft, which are understood to have been developed recently in both France and Italy. Some of these foreign planes are said to have engines of 1,000 horsepower each and yielding considerably more power per pound of weight than similar American engines.

Aircraft of "Flying Wing" Design

New York *Herald Tribune*, Feb. 9.—Test flights, conducted in secret over a period of several months, have at last proved the feasibility of the "flying wing" idea for heavier-than-air machines, a universal objective of aircraft designing, it was learned here today.

The principle of the flying-wing design, long recognized as a need in aviation, is to inclose as many of the factors of flight as possible, pilot, crew, power plant, and fuel and all of the pay load—passengers, mail, or express—in the wing formation, so that only the flying and control surfaces are exposed to the air. The earliest recorded conceptions of this idea go back more than twenty years.

The design for which success is now claimed is the work of the engineers of the Northrop Aircraft Corporation, a division of the United Aircraft and Transport Corporation. The secret tests with the Northrop "flying wing" were made at the United Airport here and at Dry Lake in the Mojave Desert. In the tests the all-wing plane attained speeds in excess of 100 miles an hour with a sixty-horsepower engine.

The plane with which this remarkable feat has been achieved is simply a working model. As a result of these experiments, Northrop engineers predict passenger transports cruising at 160 miles an hour and mail and express planes with speeds in excess of 200 miles an hour. The "flying wing" for such practical work is not yet perfected, but the success which has come in flying the new type is regarded as of the utmost importance in eventual achievement of the desired goal.

The plane flown here has a wing span of thirty feet. The craft is of the pusher type and the propeller works in an outrigger frame, which carries the tail surfaces. The propeller shaft protrudes only a short distance behind the trailing edge of the ship. The motor and the pilot's cockpit have both been skillfully tailored into the wing formation.

The Northrop "flying wing," projected commercially as a development of the model already flown, would differ from the conventional type in this important feature: it would have no fuselage, and its retractable landing gear, consisting of three wheels, would be under the wing in triangular arrangement. The front wheels are placed considerably further forward than is normally possible, reducing possibilities of a nose-over. The rear wheel is made steerable, providing maneuverability on the ground. Practically the entire plane is wing, affording greater speed for a given horsepower.

Innovations Planned for "ZRS-4"

New York *Times*, Feb. 16.—Among the innovations incorporated in the construction details of the new *ZRS-4*, the first of two new 6,500,000-cubic-feet dirigibles for the Navy now evolving about the first golden rivet driven a few months ago in the huge hangar of the Goodyear-Zeppelin Company at Akron, are facilities for storing five fully rigged military airplanes with a launching trapeze for them, and an extensive water recovering plant which will operate on the exhaust gases from the eight heavy duty engines.

Recent tests and exhibitions have shown the practicality of seizing or launching airplanes in full flight from dirigibles, and outlines of the value of such procedure, by naval authorities, maintain that such practice will enable dirigibles to act as airplane bases far from centers of supply, which, when added to the other advantages of the airship, will make the dirigible one of the most valuable means of aërial attack or defense of the Navy.

The airplanes will be flown to the trapeze where they will be caught by hooks on the upper wings and then hauled into the hull of the *ZRS-4* through a T-shaped opening. The storage room in the hull is to be 75 feet long and 60 feet wide, and the doors covering the opening have been designed to collapse in a novel manner.

The water condenser, acting on the exhaust gases, will take the water vapor formed by the oxygen of the air used in combustion through a system of connected tubes exposed to the air stream. This theory has always been known but has been avoided in former dirigibles because of the great parasitic resistance of the tubes. The *Los Angeles* has used it despite the resistance. The Goodyear engineers, however, have simplified the problem by running the tubes in the form of corrugated plates along the hull sides and using a system of heat exchangers or pre-coolers to dispense about 80 per cent of the initial heat.

The water separators will be at the bottom of the condensers along the side gangways of the hull and more water can thus be produced in flight than the weight of the fuel burned, so that the craft can be kept in constant balance. This practice will allow the new ship to carry more lift gas by virtue of the decreased storage space required for liquid fuel.

The Hanson Audio Piloting Cable System

N. W. Ayer and Son, Feb. 11.—The perfection of the Hanson audio piloting cable system for guiding blind aircraft to safe landings, keenly followed by radio engineers and leaders in the aviation industry for two years, was announced by Earl C. Hanson, of Chicago, the inventor, January 29, at the Ford Transportation Exhibit in that city.

Before its announcement numerous successful landings were made at the Ford airport, Lansing, Illinois, by pilots relying solely upon head phones and meter readings for their altitude-above-ground readings and direction. In making the announcement Mr. Hanson said the development of the system, which will rob the air lanes of the hazards of blind flying, was made possible by the equipment placed at his disposal by the Ford Motor Company. Ford tri-motored monoplanes and the use of the company's airport at Lansing were made available to him for the two years of experimentation.

Briefly, the system, based upon the principles of electro-magnetic induction, provides for parallel cables radiating from the edges of flying fields, every other cable emitting a code in dots and the alternating cables dashes. A code is picked up by a loop at-

tached to the plane and made audible, or visible, to the pilot by the use of audion amplifier tubes.

An altitude checking ground antenna activates an electric altimeter which translates that intensity into actual height above the source, or cable. Thus, if the loops are draped over high tension lines, poles, bridge heads, roofs, or other ground obstructions the pilot receives an altitude reading which is exact from the height of that obstruction.

The altitude checking ground antenna equipment consists of a loop of buried cable several thousand feet long and 600 feet wide. The loop may be elevated on short poles if the terrain or conditions favor such an installation.

A motor generator provides the alternating current for energizing the loop antennæ. A wattmeter associated with the cable system would show the amount of power delivered to the radiating system. Since atmospheric conditions or time of day or night do not in any noticeable way affect the transmission of electro-magnetic wave energy emanating from the ground cable system it is possible to obtain approximate height of aircraft above the ground pilot cable system.

The United States Department of Commerce, Bureau of Mines report, November, 1929, says that experiments based on the Hanson inventions conducted at Mammoth Cave show that the audio frequency electromagnetic wave energy passes readily through 900 feet of continuous rock. Large bodies of salt water offer virtually no opposition to the transmission of the audio wave energy from submerged cables to marine vessels.

The following is a description of the simplest cable installation for indicating entrance to one side of an airport: Two closed loops of buried cable spreading from 200 feet near the entrance to the field to 1,000 feet across at the outer extreme form one complete dot-dash system. An alternating current generator is connected through constant energy regulating devices and a rotating contact breaker to each cable. The rotating contact breakers are arranged in such a manner as to allow one cable to project an invisible beam of audio frequency wave directly above the cable system, the interruptions in the one cable forming dots and in the other dashes.

This system allows a pilot to know if he is going in a definite direction. His map of the airport would indicate the location of the cables in respect to the landing field. To indicate to the pilot the exact edge or entrance of the field, another loop, 600 feet long by several hundred feet wide, is positioned at the entrance and at right angles to the entrance cable loops and connected directly to the generator. No rotating contact breaker or interrupter is used in this circuit though a constant energy regulating device is required.

A more elaborate airport installation would consist of several of the units mentioned in order that a plane could approach a field in a direction best suited to the weather conditions prevailing. A directional signal, to indicate compass points, might be transmitted from the dash guiding cables spaced with pauses to indicate the cardinal points.

A still further refining feature of the system would be the utilization of buried cables stretched across the landing field and positioned, for example, 1,000 feet from the edge. This cable system could be energized by a 500-cycle generator. The object of this cable would be to indicate to the pilot when his craft is taxiing across the field to within a thousand feet of the far end. The same generator could be used to furnish power to the protective cables for various sides of the field. If desired, interrupting switch mechanism would indicate which edge of the field the craft was approaching.

The most elaborate and most practical system, if cost of installation were not important, would be to use a high-power electric generating phonograph to energize the "gun coil," the coil positioned at the edge of the field, and give the name of the airport and its position on the compass. Voice and music transmission at audio frequency has been tried at the Ford airport and proven successful. By use of special relays, a row of vertically placed electric lights could be used to indicate general height of aircraft above the altitude ground cable loops.

Receiving equipment for aircraft may be of several kinds. For small private craft there may be loop antennæ comprising thousands of turns of a fine copper magnet wire, enclosed in a waterproof bakelite case approximately 14 inches in diameter and 2 inches thick. A small waterproof flexible cable would connect the loop antennæ to the input of a 3-stage audio frequency audion

amplifier. This amplifier greatly increases the strength of the audio frequency signals received wirelessly from the electrically energized cable system located on the ground. With slight modification, the present aircraft radio receiving set may be employed.

Either head phones or a calibrated electric meter may be used. As a plane descends over the electrically energized ground cable system the electro-magnetic wave energy intercepted by the loop antenna increases. This amplifier energy actuates the meter causing the needles to indicate to the pilot that the craft is reaching a point a definite distance from the ground. The head phones may be used in conjunction with the visual indicating meter.

A light metal waterproof battery case is provided to encase the batteries furnishing electrical energy to the vacuum tube amplifier. The condition of the batteries can be determined at any time by the pilot by means of a small double scale meter mounted on the front panel of the audion amplifier.

For passenger planes the loop antenna is mounted within the metal wings, as was the case with the Fords used in flight tests, and placed several feet from the wing tips. To prevent absorption of the electro-magnetic wave energy, non-metallic material such as laminated micarta, may be employed. The micarta may be secured in such a way as to maintain the stream line of the wing. The audio frequency wireless wave energy from the ground passes readily through the micarta and creates electrical energy in the thousands of turns of wire comprising the loop antenna.

The multiple stage audion amplifier may be located in any convenient part of the craft. The apparatus can be turned on or off by remote control switch mechanism mounted on the instrument board. The battery case may be placed at any convenient point. Besides the use of the audible signal and visual indicating meter, it is possible to use electric relays in such a manner as to control flight of the craft over a predetermined course without the aid of anyone on the craft except in making final landing.

Psychological Reaction Testing Device for Aviators

Aero Digest, Feb., by S. R. Winters.—A mechanical and electrical "psychology teacher" has been evolved for testing the mental qualities of prospective pilots. As a complement to such training devices as the Ruggles orientator, the Reid apparatus of England, and the "flight tutor" of the Army—in which physical fitness is the primary test—this new testing outfit tacitly but frankly asks the student of aëronautics, "Are you mentally competent to pilot an airplane, even admitting your physical ability?"

Paralleling the method of selecting employees for the United States postal service—railway mail clerks, postoffice clerks, etc.—Dr. J. J. O'Rourke of the United States Civil Service Commission conceived the idea of having a mechanical and electrical device administer psychology tests to would-be fliers. His idea was translated into a mechanical and electrical unit by Dr. W. G. Bromacher, chief of the Aëronautic Instruments Section of the Bureau of Standards, and his staff of assistants. With the completion of the instrument, it was introduced to service by the Army Air Corps at the School of Aviation Medicine, Brooks Field, Texas. It now serves the special function of a correlation device—the results of psychology tests as determined by this machine are compared with the results of his school grading, and if the two coincide the apparatus may be accepted as an infallible index to the mental fitness of prospective pilots.

This psychology teacher not only gives its own course of instruction, but grades the student and scores his examination papers at the same time. This is accomplished by a machine known as the kymograph.

On a moving drum is written the fate of the aspiring aviator, the recording unit being connected by intricate wires with the test machine proper. The equipment proper, though not resembling an airplane in appearance, is intended to duplicate the main control units governing flight. For example, there are a control stick and a rudder bar. Seated in front of a board on which appear four rows of eight lights each—two rows green, two rows white—the pilot-in-the-making is told to place his feet on the board simulating the rudder bar of an airplane, meanwhile holding the stick corresponding to the control stick on a plane. At a small table behind the test board, the operator giving the test has a keyboard at his command, and a mirror is positioned at a convenient angle over the board to facilitate his seeing the lights.

The prospective pilot is told, previous to the actual test, that the operator will cause a green light to shine, and the student is required to move the control stick or the rudder, whichever it may be, so as to illuminate a white light under the green light which is burning. One row of lights is governed by the rudder bar and the other by the control stick. Two isolated green lights are placed under the two regular rows of lights, and should the operator illuminate these, the student being subjected to test is instructed to cause all of the white lights to burn at the same time. A clock in the recording unit registers the time the light is flashed by the operator and the period required for the student to complete the lighting of the white light.

When this mechanical and electrical "psychology teacher" was subjected to preliminary trials at the Bureau of Standards, where it was constructed, the excellent flying records of two experienced aviators were vindicated, whereas two novice pilots made low scores in their reaction to the tests—thus pointing to the value of this instrument as a gage to the power of concentration and mental qualities of a student.

As previously stated, the device has been adopted by the Army Air Corps at the School of Aviation Medicine, Brooks Field, as a sort of "dean of teachers" for consultation when students fail in the conventional aviation courses.

New Type of Wheel Brake for Aircraft

Aeronautical Engineering, Jan. 29.—The Sikorsky Manufacturing Corporation has been investigating the problem of wheel brakes for their large twin-engined amphibian. The problem of fitting brakes to the wheels of a retracting undercarriage has presented many difficulties.

The company has experimented with the various types of standard wheel brakes on the American market, but in the end it has been compelled to produce one of its own design to suit the particular requirements of its amphibian. The result is the Sikorsky multiple disc brake.

This brake consists of three stationary units, each comprising three radial arms set at 120 degrees. Between the extremities of the arms, and normally free to revolve, are two rings which are attached to the wheel rim. The ends of the arms are provided with brake lining. The outside and inside arms have lining riveted to the inner sides, and the middle arms have lining riveted to both sides.

On each of the arms is a small cylinder connected by flexible piping to two hydraulic cylinders in the cockpit which are operated by the normal brake pedals.

Each of the small cylinders has two pistons connected to rocking arms so that when pressure is applied the pistons travel outward and the outer extremities of the rocking arms tend to clamp the three stationary arms and the revolving rings together.

The two revolving rings are anchored to the wheel rims by three tongues riveted to the rims and passing through slots in the rings. This permits the use of any type of standard wheel except for the three light tongues.

Uniform pressure is obtained over the braking area without undue weight. The three stationary units are .062 inch thick, but as the placing of the metal is in line with the stresses these three units transmit a torque of over 25,000 inch-pounds to the axle.

The new Sikorsky brake has been quite satisfactory in operation and free from any troubles caused by alternate immersion in salt water and quick drying after taking off.

Glider Launching from the "Los Angeles"

Aviation, Feb. 8.—With the successful launching at Lakehurst of a secondary type German glider from the dirigible *Los Angeles* in flight, plans are now being considered for equipping airships with them and further testing out the possibilities of releasing engineless planes from lighter-than-air craft. Rear Admiral William A. Moffett, chief of the Navy Bureau of Aëronautics, has suggested the scheme could be utilized for discharging passengers while a ship is in flight, and in time of war it might prove useful in carrying men and munitions to inaccessible areas where quiet landings could be made in gliders.

Lieutenant Ralph S. Barnaby flew the glider after it had been released from beneath the *Los Angeles* in a manner similar to that of launching a bomb. Let loose at approximately 3,000 feet, Barnaby glided for 15 minutes to make a successful landing on the Naval Air Station airport after having circled the field about a dozen times. The crossbar used in holding the glider to the dirigible was the same used in the plane-launching and taking-on experiments several months ago at Cleveland.

The problem of landing a ship in strange territory might be overcome by the use of a glider, believes Lieutenant Barnaby, by glider-launching several officers and crew who, upon landing, could gather together a ground crew and instruct them as to the handling of the airship.

Trend of Design of Commercial Aircraft

Aviation, Feb. 15, by Captain H. C. Richardson (C.C.), U.S.N., Retired.—The general trend of design appears to be toward multi-place cabin planes, with high or low wings. The principal effort will be to clean up aërodynamically, avoid all possible protuberances by either streamlining or retracting the landing gear. Cantilever wings of the monoplane type will gain in popularity.

Very large planes have been projected and are even under construction. Perhaps this has reason in anticipation of future public interest, but it appears premature and ambitious and hardly warranted by present public demand. Ten-place appears reasonable and should be popular; 20- to 30-place possible of commercial success; 50- to 100-place reasonably possible of attainment with little chance of commercial success—and over one hundred more or less fantastic and visionary promotions at this time. Even larger planes are realizable, but can hardly prove efficient without considerable research and development.

The result of the Guggenheim competition will undoubtedly advance the sentiment toward inherent stabilizing elements, and may produce some inventions equal or superior to those demonstrated in that contest. I look for greater progress in better proportioned controls and the avoidance of gadgets.

The increased performance demanded will undoubtedly lead to greater use of cantilever wings; the first step being the semi-cantilever, perhaps, with sesquiplanes.

The demand for performance will tend to stretch design loads to the upper limits permitted by the Department of Commerce —though this will be countered to some degree by the Guggenheim competition results.

The cantilever effort will probably result in a decreased aspect ratio.

Wood construction will principally remain in popular types and in new experimental designs which, if they obtain popularity, will be quickly translated to metal. However, there will be a price deterrent.

Duralumin will probably continue its sway. Too little has yet been accomplished in alloy steel strip construction in this country to expect much advance in that type.

Combination oleo and balloon tires will become more popular. Tandem wheels in larger planes may be expected. The big stroke oleo is partly defeated by Department of Commerce drop test requirements. Oleos need still further study to eliminate peak loading.

Increased use of brakes and tail wheels will tend to force the main wheels forward, and require oleo tail skids, or balloon wheels on tail skids. The wheel tail skid makes this less of a handicap than with the previous construction.

Army to Control Coast Defense Units

Aviation, Feb. 22.—An agreement finally reached between Army and Navy authorities gives the former entire control of coast defenses, including aircraft, a report reveals. Conferences between boards of the Army and Navy, aided by a joint congressional commission in charge of Senator Bingham,

president of the N.A.A., had been held over a long period of time, but the conclusions were not immediately shaped for use.

The announcement of the settlement of this problem came with the word that the War Department is making plans for the establishment of a new antiaircraft unit at Aberdeen, Maryland. As agreed upon, the Army will have charge of both defensive and offensive antiaircraft operations and the manipulation of planes at coastal bases. Under a reorganization of the Coast Artillery Corps taking place, training activities will be centered at Long Island Sound, Chesapeake Bay, Pensacola, and Puget Sound.

Included in the coast defense posts turned over to the Army are those at Portland, Maine, Portsmouth, New Hampshire, Boston and New Bedford, Massachusetts, Narragansett Bay, Eastern New York, Southern New York, Delaware River, Potomac River, Charleston, South Carolina, Savannah, Georgia, Key West and Tampa, Florida, Mobile Bay, Galveston, Texas, San Diego and Los Angeles, California, and the Columbia River.

Eight Coast Artillery regiments are to assume antiaircraft duties it is stated, and five harbor-defense units will maintain a full force of from 300 to 500 men. Only skeleton crews will be left at some of the important gun centers so as to have more of the 6,395 Coast Artillery personnel available for antiaircraft bases.

Air Defense and Navy Reductions

Army, Navy and Air Force Gazette, Jan. 30.—The Air League of the British Empire has done well to refer, in a manifesto on the Naval Conference, to the close coöperation which has been developed and maintained between naval and aërial organization. One is the counterpart of the other. A reduction in the one naturally involves more work and responsibility for the other. The Air League points out that no modification in the strength and disposition of British sea power could take place without involving an adjustment of the air arm of naval and imperial defense, which raises the question of the present relative standing in air power of the nations represented at the conference. France is easily first with 1,730 first line and 3,000 reserve aircraft; the United States, second, with 1,463 and 350, respectively; Italy third, with 840 and 800; and Great Britain only fourth, with 772 first line and 520 reserve machines. Of all nations in the world which have given evidence of the desire to reduce armaments, Great Britain is by far the most conspicuous example. It would be a natural, and indeed an essential step to utilize some of the savings which are expected from the Naval Conference upon the strengthening of her power in the air. Development in this country is manifestly much behind that of other nations in this important medium.

MISCELLANEOUS

Future Naval Tactics

Naval and Military Record, Feb. 5, by Sir Herbert Russell.—What the Naval Conference may or may not bring forth as the ultimate sum total of its labors is in the lap of the future. It has so far discussed much and—as far as it is possible to determine—decided little. In relation to the considerations implied in the title of this article the question of reduction is of little moment: that of abolition of every moment. If, despite the improbability of the moment, the battleship and the submarine are to disappear, say within the course of a decade, we shall have clearly to visualize a substantial modification of the existent code of naval tactics. The old axiom that methods change but that principles remain immutable will be put to a pretty searching test it seems to me. Surely to eliminate the ship-of-the-line and all that she stands for means to eradicate an old fundamental principle of sea warfare. I am not questioning the wisdom of eradicating this principle of the decisive clash by great fleets. For years past I have been expressing the view that it has eradicated itself. General von Gröener, German Minister of Defense, in describing the *Ersatz Preussen,* said that the world will never witness another great conflict of big fleets like Jutland, and I feel that he is right. Yet such a conclusion seems to leave a great blank in the whole conception of naval tactics which calls for a strong effort of imagination to try and fill.

With the battleship gone the immemorial idea of victory by big battle will be gone. In such an orientation what is the future of naval warfare? Today all the naval powers appear to be preoccupied with the sole idea of defense, of guarding sea communications, and protecting their own coasts and their

territorial possessions. But the necessity for defense presupposes the prospect of attack. Indeed, so long as warfare continues to exist we are never likely to neutralize the Napoleonic doctrine that attack is often the best form of defense. The battleship is the vessel of grand aggression. In doing away with her we should renounce the elementary principle of grand aggression. This is not quite the correct way of putting it, for the passing of the battleship will simply mean a general admission of the fact that she has outlived her rôle and that the fleet touring between long lines of stately ships has gone the way of a good many other stately ships in the prosaic evolution of modern life.

But a purely defensive policy cannot escape the necessity for tactical concentration. We cannot imagine, in a future great war, our big cruiser fleet diffused all over the seas, playing at *Emden*-hunting, so to speak. Such a plan would be a deliberate invitation to our enemy to do a bit of concentration wherever he chose and reap the fruits of superior force. As I have said before, I think that the tendency of sea warfare will be to become more guerrilla in character, although, again, this will be largely determined by the strategical features of the war. Two contiguous powers are not going to uncover their sea frontiers for the sake of playing hide and seek along the ocean trade routes. They will retain defensive squadrons of their primary ships so disposed as to fulfill the obvious truism that defense begins at home. The primary ship of the future may be the equivalent of the cruiser today, more heavily armed possibly, although even as to this I am not by any means sure. So long as you can get international agreement to equality in weapons it is immaterial what those weapons are since neither side will have an advantage in range. Such equality would stultify the scope for tactical exploitation; on the other hand it would not affect the lesson of Trafalgar as to the decisive value of bringing to bear the heaviest weight of artillery upon a section of the enemy fleet, although an almost complete circle of fire render this much more difficult to attain than the extremely limited arc of broadside fire.

It is legitimate to argue that the primary ship of the future, whatever her type, will perpetuate the functions of the battleship of the past. If this were absolutely true there would be no case for the abolition of the battleship. I think that the primary ship of the future will have to merge functions. She will have to carry her protective rôle into the open and not exercise it by the process of passive pressure. In this respect she will be exercising the guerrilla idea which I suggest. She will be designed for independent action even if she is employed as a fleet unit. The battleship proper is designed solely as a fleet unit. War means fighting, and in the issue it is decided by the skill with which that fighting is conducted. The destruction of war is not an end, but a means to an end. The traditional idea of naval warfare is for the main fleet "to seek out and destroy" the enemy main fleet, failing this to exercise the economic blockade so as to cripple the enemy power of resistance. This conception materialized in the building of the biggest and most powerful ship so as to beat the ship of the other fellow. It was a straightforward game of response. But it has reached finality, like every form of human conception. The submarine, the destroyer, the mine, and the aircraft have enabled two of the great European naval powers to discard the construction of battleships and yet regard themselves as reasonably secure against those powers which still maintain battle fleets.

There is really nothing new in this. Although none realized it at the time, it was born when steam and steel began to replace wood and sail. Reliable mobility on the one hand and the severe restriction of seakeeping endurance on the other were bound to break down the sturdy conservation which sought to perpetuate the principles of the rigid line and the seeking out of the enemy wherever he might choose to hide. But it was not until the present century that the doctrines of the French *Jeune Ecole* began to receive serious attention in this country, at a time when, curiously enough, they were weakening in France. At the opening of the present century the battleship could come and go upon the high seas as mistress of all she surveyed. There were no hidden threats to her dominance. Had the Great War started in 1900 instead of 1914 there would have been no frantic anxiety to boom in the Grand Fleet at Scapa Flow. Even then we did not realize the part the mine was going to play: so little did we realize it that we had to borrow mines from the Russians to lay off our own harbors.

If the battleship goes—as seems probable

—and the submarine goes—which is less probable—it is difficult to see what in particular the destroyer will be wanted for. Her presumptive job is, alternatively, to attack the battle fleet or to protect it. The cruiser can do her own torpedoing without the assistance of a destroyer; in fact, most of the modern types of cruisers are furnished with more torpedo tubes than the destroyer. The French and the Italians have developed their destroyers into quite respectable little cruisers, thereby suggesting a conclusion that their original function has lost its limitations. But the French and the Italians have not built any battleships for the past fifteen years.

As to the naval tactics of the future it is very difficult to see anything definite through the present haze of uncertainty. In any case tactics are the handmaiden of strategy and before you can attempt to speculate upon the employment of forces you must have some idea of the character of the war. If we are to regard the *Ersatz Preussen* as typical of the primary ship of the future we are faced with the possibility of a much extended radius of action and a corresponding degree of independence of operational bases. This condition seems to me likely to foster the growth of guerrilla warfare. Should the abolition of the submarine come (not this year, nor next year, but some day, for in looking into the naval future we must take very long views) then clearly the task of commerce protection would be greatly simplified. On the other hand, a great extension of sea-keeping capacity of cruisers would result in a wider raiding ground. The *Emden* could only keep the sea over a radius of about 3,000 miles, and we know what mischief she succeeded in doing under great difficulties in the way of maintaining supplies. A cruiser with a radius of 20,000 miles—quite feasible with internal-combustion engines—could keep the sea for more than two months at an average speed of 13 knots. What a dozen such ships might accomplish against commerce needs no laboring. It is against such a possibility that our naval policy nowadays is mainly directed.

There is this to be remembered. If a power is going to employ the bulk of its fleet in commerce raiding it will have little left for home defense. The question is how far home defense in the future can be left to "mosquito craft," mines, and aircraft. If the submarine is to be abolished one of the chief weapons of this species of defense will have vanished. How far aircraft could replace her is still a theme of conjecture, but it is impossible to believe that in night operations or thick weather aircraft can ever deal effectively with warships. I imagine that we shall always favor the principle of squadron tactics whatever an enemy may do, thereby perpetuating to that degree the functions of the battleship. It is conceivable that an enemy might elect to scatter all his cruiser strength in an attempt to play havoc with that trade upon which we are so vitally dependent. Battleships could not deal with such a situation in any event. They would be absurdly uneconomic to use in squadron operations against coast defense forces of the "mosquito" order. Ships of an equivalent type to those which an enemy would employ in a trade guerrilla warfare would be quite effective enough to compel the enemy to retain or recall a sufficient number of such ships to his coastal waters to meet any concentration we might make in those waters. Possibly in the next great war aircraft will be so numerous and so powerful as to render coastal waters unapproachable to hostile warships. In this event the navies will have to go into blue water to do their fighting—yet another example of the guerrilla tendency which I suggest is likely to be increasingly imposed by the trend of scientific progress.

NOTES ON INTERNATIONAL AFFAIRS

From February 3 to March 3

Prepared by Professor Allan Westcott, U. S. Naval Academy

THE LONDON NAVAL CONFERENCE

Conference in the Doldrums.—From the return of the French delegation to Paris in mid-February, quickly followed by the upset of the French cabinet, the London Naval Conference marked time. There was some discussion of special problems among British, American, and Japanese delegations, but it was apparent that the success of the conference, if it was to be measured by actual reductions, was dependent on some modification of the French program for building their Navy up to 725,000 tons by 1936. To meet this, the British naval requirements must be increased, with corresponding American increases on the postulate of parity. On the other hand, the French delegation made any reduction of their program contingent upon some sort of guarantee of increased security. No such guarantee could be of much value—nor could it be acceptable to England—without the inclusion of the United States. And however favorable a part of the American delegation might feel toward at least exploring the possibilities of such a guarantee, its chances of ratification by the United States Senate appeared remote.

Hence it was not surprising that press dispatches turned suddenly pessimistic. The Beaverbrook and Rothermere press declared the conference a failure. The American correspondence was also pitched in a low key. "As a conference for reduction," wrote E. L. James in the New York *Times* of February 24, "the five-power meeting, so far, has failed. But perhaps it never had any chance to be a reduction conference. . . . . There seem to be no insuperable obstacles to writing a limitation treaty. . . . . This will mean billion dollar parity for the United States, but she can still have a treaty. It does not do to consider such a treaty worthless. For its duration of five years each nation will know where the other stands." Organizations pushing disarmament declared the conference had started wrong and should tackle the security problems as the French desired.

Among definite accomplishments were listed the following: (1) A prospective five-year battleship holiday. (2) The humanizing of submarine warfare assured. (3) The settlement of the global tonnage problem, a controversy of years' standing.

Submarine Curb Pact to Be Drafted.—The most definite decision reached in the conference during February was the agreement on February 11 to formulate a pact regulating submarine warfare. "This," declared Secretary Stimson, "was worth the visit of the American delegation. This marks a step forward in a matter that our country once went to war about." He might have added that our country went to war partly because of violation of the rule about to be re-formulated.

The agreement followed an open session in which the delegates of all the chief powers expressed their views on the subject, France and Japan refusing to abolish the submarine but quite ready to "humanize its use." The drawing up of the proposed treaty was given over to a committee of legal experts, who in turn were to refer it to the naval experts, after which it would either be made a part of any general agreement that may be reached in London, or submitted separately for ratification by nations who so desired.

ILLNESS FORCES ADMIRAL JONES'S RETURN.—Following a physical examination which indicated that he was suffering from ulcers of the stomach, Admiral Hilary P. Jones found it necessary to retire from the United States delegation at the London conference and return to this country. Admiral Jones sailed from England on February 25. Prior to the announcement of his illness there had been rumors of his retirement because of dissatisfaction with the action of the American delegation in consenting to some reduction in its requirements for large cruisers.

NATIONAL REQUIREMENTS STATED.—Early in February all of the five nations participating at London made formal statements of their naval requirements, which had the value of representing at least the initial or bargaining position of each power. As stated by Mr. Stimson, the United States desired parity with Great Britain; immediate limitation of the British and American capital ships to fifteen for each; the United States to have eighteen 10,000-ton, eight-inch gun cruisers to fifteen for Britain, and 147,000 tons of smaller cruisers to 177,000 tons for Britain, with the option to each nation of shifting tonnage between the two types; for destroyers equality in tonnage, and for submarines the lowest tonnage possible. The British demands were similar but were put in somewhat less definite terms.

The French statement on February 13 startled the conference by calling for a total tonnage in 1936 of 724,500 tons, giving her roughly 65 per cent of the British and United States fleets, and 85 per cent in the smaller categories. The French proposals ended with the statement that any agreement for security would transform the "absolute requirements of each power into relative requirements." Japan did not put explicitly her demand for 70 per cent of the British and American tonnage in all auxiliary types, but this was called for in subsequent memoranda. Japan favored a holiday until 1936, reduction of battleships to 25,000 tons, extension of age limits to twenty-five years, and maintenance of her existing strength in submarines. Italy maintained her policy of parity with France.

FRENCH OFFERS FOR SECURITY.—In the interim of the French governmental crisis there was much discussion of the possibility of meeting the French request for security guarantees as the price of naval reduction. It was said that M. Tardieu would offer a 10 per cent cut in his 725,000-ton program for an agreement of the powers to consult in a crisis, and 20 per cent if they would promise not to aid an aggressor. It was further rumored that France would be satisfied if President Hoover would formally announce, without approval of the Senate, that the United States would suggest international consultation among Kellogg pact signers in the event of a crisis, after the precedent of the consultations over the Manchurian crisis last autumn. A Mediterranean agreement, it was said, would not necessitate American participation. It was doubtful what value could be attached to a presidential proclamation, such as suggested; but it was certain that the Senate would regard it as a derogation of its share in the treaty-making power and a dangerous commitment of this country in foreign entanglements. Mr. Hoover also made it clear that he would take no such action.

INTERNATIONAL ORGANIZATIONS

DIRECTORS OF INTERNATIONAL BANK.—Governors of the central banks of Great Britain, France, Germany, Italy, and Belgium, with a Japanese representative, met at Rome on February 26 to appoint the board of directors and make other arrangements preparatory to the formal opening of the Bank for International Settlements set for about March 15. Sixteen directors were named—three each for France and Germany, and two each for Belgium, Great Britain, Italy, Japan, and the United States. Eventually there will be twenty-five directors, the remaining nine to represent Holland, Spain, Switzerland, and other countries not included among the original organizers. The American directors are Gates W. McGarrah, former chairman of the board of the Federal Reserve Bank of New York, and Leon Frazer, a New York attorney and international lawyer. Mr. McGarrah will be chairman of the board of directors of the new bank, and it is expected that Pierre Quesnay of the Bank of France will be made manager. Messrs. McGarrah and Frazer sailed from New York on March 1.

EASTERN EUROPEAN REPARATIONS SETTLEMENT.—The conference on eastern

European reparations, meeting in Paris during February to complete the Hague arrangements relating to the eastern European nations, was held up at the end of the month not only by the French ministerial crisis but by the indisposition of some of the eastern countries to carry out the concessions they had been persuaded to make at the Hague. In the event of failure of these countries to reach agreement, the major powers, Great Britain, France, and Italy, may exercise their right under the peace treaties to dictate a settlement.

TARIFF TRUCE CONFERENCE.—Although declining to send a regular representative to the "tariff truce" conference which began at Geneva on February 17 under League auspices, the United States government in a letter "viewed with approval" the aims of the conference, and instructed Mr. Edwin C. Wilson, first secretary of the American Legation at Paris, to go to Geneva as observer. The purpose of the meeting, which was attended by fifteen finance ministers, three former finance ministers, and one foreign minister, was to establish a program for subsequent negotiations to facilitate international economic relations and reduce hinderances to trade.

FRANCE

MINISTERIAL CRISIS.—By a majority of only five votes, 286 to 281, the Tardieu Ministry after three months in power in France was defeated February 17, in a vote of confidence called for on an insignificant clause of the finance bill then before the Chamber. Premier Tardieu was ill at the time, from a severe attack of influenza. The vote of confidence was demanded by Finance Minister Cheron after a series of very close divisions on various clauses of the budget.

Camille Chautemps, leader of the Radical Socialist opposition, was called upon to organize a cabinet, and secured Briand's support, but was defeated by fifteen votes on his first encounter with the Chamber. So close was the balance between the Right Center and Radical groups, that it appeared likely that a ministry of either group could be defeated with the aid of the ten Communist votes cast with the opposition, and that recourse to a new election would be necessary. Between the two groups, however, there was little real disagreement except over party jealousies and details of internal finance policy. M. Tardieu was again asked to head the government, and on March 1, announced a cabinet with certain changes which it was hoped would draw votes from the moderate Radicals. Success of this government, in its first appearance before the Chamber on March 6, would insure the return of M. Tardieu and M. Briand as heads of the French delegation at London.

EUROPEAN GOVERNMENTS

AGITATION FOR REPUBLIC IN SPAIN.—The long awaited speech on February 27 of Sanchez Guerra, veteran Conservative opponent of the fallen dictatorship in Spain, was a bold declaration in favor of the overthrow of the present monarchy. Intimating that the time was ripe for a republic, Guerra declared his "unalterable opposition" to continuance of King Alfonso's rule. The speech was accompanied by republican demonstrations in the Madrid streets. As an outcome of the agitation, the Berenguer government swung quickly back to higher censorship, political arrests, and postponement of elections. The alternatives in Spain appear to be another dictatorship or a revolution.

BRITISH CONSERVATIVE PARTY SPLIT.—Lord Beaverbrook and Viscount Rothermere, press magnates in England and heads of the faction in the Conservative party opposed to the leadership of former Premier Stanley Baldwin, came out in February with threats of a new party alignment in support primarily of the policy of free trade within the empire and stronger imperial solidarity. In reply, former Premier Baldwin pointed out that there could be no question of immediate free trade, partly because of opposition in the self-governing dominions, and partly because the crown colonies depend on export and import duties for revenue. A break in the Conservative ranks, he declared, would insure a Labor victory in the next election, and effectually destroy all hopes of an approach toward free trade within the empire in the immediate future.

FOREIGN HOSTILITY TOWARD SOVIETS.—During the past winter there has been a notable revival of hostility abroad toward the Russian Soviet régime, marked by the

recall of the Mexican legation at Moscow, the agitation in Germany owing to the discovery of communist activities in the army, the sensation in France over the kidnapping of the White Russian General Kutiepov on the streets of Paris, and the protests in England and America against religious persecutions. In an article in the New York *Times*, the Moscow correspondent, Walter Duranty, seemed inclined to believe that underneath all this hostility might be a genuine fear of Soviet trade rivalry in the international field. If the present thoroughgoing policy of socialized industry in Russia should meet with any great measure of success, the Soviets might in certain products be able to undersell the Capitalist powers.

In England, however, the hot agitation against Soviet anti-religious persecution was open to a much simpler explanation—as partly genuine, and partly a political move on the part of the Conservative leaders and press to stir up popular sentiment against the Labor government. In an open letter on February 24, Premier MacDonald deplored the use of "anti-Russian propaganda by Conservatives for political purposes at home." "Agitation inspired by politics as much as by religious toleration," he wrote, "must not deflect any government from pursuing the ordinary rules of international relationship and prudence."

In the United States, reports of the arrest of religious leaders and the closing of mosques, synagogues, and churches called forth numerous organized protests. Through Soviet agencies in this country—in the absence of regular diplomatic representation—Senator Borah sent a request for information regarding the safety of fourteen Jewish rabbis arrested at Minsk, and was assured on February 23 that all but three had been released. Figures from Moscow show that in the past twelve years about 12,000 church organizations have been closed, 600 of these in November and December of 1929, despite the fact that probably a majority of the Russian people oppose this policy.

UNITED STATES AND LATIN AMERICA

PRESIDENT OF MEXICO SHOT.—Two hours after Pascual Ortez Rubio, new President of Mexico, had taken the oath of office on February 5, he was shot and seriously injured while driving home with his family from the National Palace. Six shots were fired by the assailant, a young political or religious fanatic named Daniel Flores, one of which broke the President's jaw. His wife, niece, and other members of the party were injured by the shots or by shattered glass. Government officials attributed the attack to a plot of the defeated Vasconcelistas to produce a political chaos and thus upset the government. It was announced on February 19 that the trial of Flores would be conducted by civilian rather than military tribunals, though the maximum penalty that can be inflicted by civil courts is twenty years' imprisonment.

The President's inaugural speech was a tribute to his predecessor, Portes Gil, and an appeal for coöperation in Mexico's social and economic development. There were only a few cabinet changes, Portes Gil taking over the important Ministry of the Interior.

U. S. COMMISSION IN HAITI.—The commission named by President Hoover to investigate political conditions in Haiti and consider the withdrawal of American military forces left Key West on February 25 in the cruiser *Rochester*, and arrived at Port au Prince in time to begin work on March 1. The members of the commission are V. W. Cameron Forbes, former Governor General of the Philippines, who will act as chairman; William Allen White of Kansas; Charles H. Marshall of New York; James Kerney, a newspaper editor of Trenton, New Jersey; and Elie Vezenia, a newspaper man and specialist in Haitian affairs, of Rhode Island. Another commission headed by Robert R. Moton, negro president of Tuskegee Institute, will investigate Haitian education. The commissioners were favorably received by the Haitian population, and forecasts were made that they would recommend removal of the marines in three years, leaving American officers in control of the native garde.

GOVERNMENT UPSET IN SANTO DOMINGO.—At the end of February, close upon the arrival of President Hoover's commission in Haiti, a successful rebellion was put through in the other black government of the island, the Dominican Republic. Forces op-

posed to President Horacio Vasquez' plan to reëlect himself president next May secured control of the country, entered the city of Santo Domingo, and compelled Vasquez to take refuge in the fortress. Shortly afterward an agreement was arranged, with American Minister Charles B. Curtis as intermediary, by which Vasquez left the country till after the election on May 15, and Rafael Estrella Urena became provisional president.

From 1916 to 1924 the United States government maintained a force of marines in the Dominican Republic, as at present in Haiti, and United States officials still control the customs receipts for application in the public debt, which has been reduced from $32,000,000 to $21,500,000. A commission under General Dawes visited Santo Domingo last year and recommended a program of financial reforms.

President Vasquez has held office in the country since the withdrawal of the marines in 1924.

FAR EAST

FACTIONS ORGANIZE AGAINST NANKING.—Though the winter months are a closed season for Chinese rebellions, the factions in China opposed to the Nanking government were busy during February with preparations for renewed civil war. Shansi's "model governor" Yen, chief rival of President Chiang Kai-shek for power in China, held a series of conferences with Marshal Feng, the first outcome of which was a telegram to Chiang proposing that he resign. Next Yen issued a circular signed by forty Chinese leaders calling for a meeting of the Kuomintang Executive Committee at Peking, and declaring its last year's meeting at Nanking illegal. All indications pointed to the establishment of a rival northern government under Yen at Peking with support from anti-Nanking elements all over China. Such a coalition, it was estimated, could muster some 440,000 troops, which would be considerably more than those controlled by Nanking. The latter, however, would have the advantage of better aircraft and other equipment, and excellent direction by German military advisers. Nanking in February placed orders in America for twelve Ryan bombing planes.

RETURN OF WEI HAI WAI.—A draft agreement was signed in February at Nanking providing for the return to China by Great Britain of the port, city, and hinterland of Wei Hai Wai. This was agreed upon at the Washington Naval Conference. England has held Wei Hai Wai under a thirty-two-year lease, secured in 1898 when the Russians took Port Arthur and Germany seized Tsingtau.

JAPANESE ELECTIONS.—A total vote of about 10,000,000 was cast in the Japanese elections of February 20, the second under universal male suffrage. The chief issues of the campaign were criticism of the Minseito government's economic policies and in particular of the business depression due to the return to gold payments. As a result of the election the Minseito government secured a parliamentary majority over the Seiyukai opposition, and in fact over the Seiyukai and minor labor parties combined—273 out of a total of 466 parliamentary seats.

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AMERICA CONQUERS BRITAIN. By Ludwell Denny. New York: Alfred A. Knopf, Inc. 1930. $4.00.

REVIEWED BY REAR ADMIRAL W. L. RODGERS, *U. S. Navy (Retired)*

These are the days when newly enfranchised women in many countries believe that great affairs and the disputes of nations can be settled by the nursery command of "love little sister." In deference to this naïve bit of femininity thrust upon world politics, its duly chosen rulers with eyes to the next election and their tongues in their cheeks proclaim aloud that "good will prevails, war is unthinkable," although, fortunately, they do not so far forget statesmanlike prudence as to renounce all armament, even by joint agreement.

This most interesting, informative, and well-documented work is based on the idea that it is an illusion to believe that international good will prevails. The author insists that, on the contrary, the economic life of the world is one of national struggle for a "place in the sun" which provokes business rivalry and jealousy liable to explode into war. He admits that neither governments nor naval nor military men want war; all know that it is not good for the public or for themselves. Nevertheless, the personal and national desire for monopoly of trade in one form or another as the source of prosperity is so great that huge companies make combines which demand government support, so that whole peoples themselves are arrayed against each other (although somewhat subconsciously) and need only a trifle to precipitate perhaps even the most dangerous disputes. A very hazardous accompaniment of this economic international tension is the "hush-hush" policy of most governments, and the American in particular, in not telling all the world what they are doing. Were the peoples made to perceive that the pursuit of trade is a source of international irritation they would probably not renounce it, but they would observe more caution and be less likely to take an irreparable step through ignorance.

With the premise that economic competition between nations is the fertile origin of wars, the author first points out the commanding position the United States has gained in production and industry since the beginning of the century and particularly since the Great War. The world is jealous of us.

To no nation has this recently acquired predominance been so disagreeable as to Great Britain, whom we have displaced in the economic leadership of the world. We are now rich, and with money to lend, our massed production, primarily for home consumption, gives us an advantage in the foreign markets. On the other hand England, burdened with overpopulation and lack of employment in many great industries, is trying desperately to hold monopoly, or at least dominance, in several lines in which our wealth threatens the severest competition. The matter at issue is the control of various

key industries, including among metals the production and marketing of copper, nickel, and tin. As to rubber, the British monopoly has already been broken, partly by Mr. Hoover's action as Secretary of Commerce, but also by the inherent difficulties in retaining monopoly in this particular commodity. But the more important key industries are oil, chemical products, and communications. The growth of the contest is traced for each. In the chapter on oil the author shows how the United States led in output and consumption for many years and then the British began to develop a competition for control of oil fields, with the intention, as some allege, of holding reserves of oil underground until such time as American resources are exhausted. At present the two governments seem each to be backing its own companies; the British government being indeed a part owner of its great company, the Royal-Dutch-Shell. In a world control of chemical production there is a similar struggle between American-British and American-German combines which are scarcely less bitter. Finally, the book traces the rise of a British cable system encircling the globe and its discriminatory use favoring British interests. A source of irritation to Britain is the development since the war of the Radio Corporation of America for its express purpose of breaking British monopoly in handling international news and business matters. The gist of the concluding chapter may be given in a couple of sentences taken from it. "We shall not make Britain's mistake. Too wise to try to govern the world, we shall merely own it." The work is well worth reading, since it gives a glimpse of the witch's cauldron seething behind governmental assurances of international good will.

ADMIRAL FRANKLIN BUCHANAN. By Charles Lee Lewis, Associate Professor, U. S. Naval Academy. Baltimore: Norman, Remington Co. 1929. $3.50.

REVIEWED BY CAPTAIN D. W. KNOX, *U. S. Navy (Retired)*

This is much more than a mere biography. The subject of the book is placed in the historical setting of his times, 1800-1874. The very interesting background thus given to this stimulating naval career obviously represents painstaking research and results in an exceedingly entertaining narrative full of action, and a very valuable contribution to our naval historical literature.

Entering the Navy as a midshipman only a few weeks after the War of 1812, Buchanan was schooled under some of the ablest commanders of that war and early became imbued with the best naval traditions of energy, courage, and efficiency. His first five years were spent in the Mediterranean under O. H. Perry and Charles Stewart, engaged in the protection and stabilization of American commerce, which had been badly disrupted during the late war.

Then followed a year's cruise to China and return in a merchant ship, while on leave from the Navy. The next six years were largely spent in the extensive operations against pirates conducted between 1823-1829 by Commodores David Porter and Ridgely. There was an interesting interlude of six months' leave in this service, during which Buchanan took a new 64-gun ship from Baltimore to Rio for delivery to the Brazilian government, then engaged in a war with Argentine.

From 1829 to 1844 there was a variety of service in the *Constellation, Delaware, United States, Constitution, Mississippi, and Vincennes,* which latter ship Buchanan commanded.

The Navy will always be much indebted to Buchanan for the conspicuous part taken by him in the founding and early administration of the U. S. Naval Academy. As the first superintendent he established an academic and disciplinary system, and instituted traditions and practices, many features of which were so sound as to be continued to the present day.

After the outbreak of the Mexican War he succeeded in obtaining command of the *Germantown* and in reaching the theater of hostilities in time to participate in the capture of Tuspan and Tabasco, and in the subsequent blockade of the east coast of Mexico.

Among Buchanan's most distinguished services were those in connection with the expedition which opened Japan. The most skillful and delicate diplomacy was necessary to avoid the use of force and yet maintain that firmness upon which the success of the mission depended. For the psycho-

logical effect Perry wisely kept himself aloof from all Japanese negotiators except those of the highest rank, leaving the burden of the difficult and exceedingly important preliminary "contacts" to Buchanan—the captain of his flagship. Both of these officers exhibited diplomatic ability of the highest order.

The outbreak of the Civil War found Buchanan in command of the Washington navy yard. He was one of those numerous officers to face the soul-rending problem of divided loyalty. When he decided to "go South," like so many others he took with him those splendid qualities and traditions which our Navy builds within a man—courage, resourcefulness, energetic and efficient action, devotion to duty, the spirit of sacrifice, and subordination of self to the cause.

In the dreadful conflict between brothers which followed, the brilliant naval tradition established by both sides has now become a common heritage.

Excepting Farragut and Porter, the war produced few builders of our naval tradition so distinguished as Buchanan. Until he was wounded, his conduct of the raid by the *Merrimac* upon the Federal forces in Hampton Roads was brilliantly executed. What would have happened subsequently in Hampton Roads, had Buchanan not been wounded on the first day, is evident from his bold attack at Mobile Bay upon Farragut's fleet after it had passed the batteries and assembled in the upper bay. The biographer has given a very vivid account of this engagement which is unquestionably one of the greatest in our naval history.

On the whole the book is very well written and the inherently interesting subject matter has been made very absorbing.

THE NAVIGATION OF AIRCRAFT. By Lieutenant Logan C. Ramsey, U. S. Navy. New York: The Ronald Press. 1929. $4.50.

REVIEWED BY LIEUTENANT COMMANDER A. C. MCFALL, *U. S. Navy*

Here is a book that should find its way into the library of every practical flyer, and of others who are interested in the science of aërial navigation.

The author, a naval aviator, has a well-rounded knowledge of his subject with a practical experience of several years' work in scouting aircraft squadrons and with theoretical and practical work in the Hydrographic Office. He actually gives in his book many of his own practical navigational problems.

The book is divided into seven parts, and each part into chapters. At the end of each chapter are questions and problems which relate to its contents.

The first part deals with the "Necessity for Navigation of Aircraft" and "Definitions." He brings out many conclusive points showing the value of aërial navigation in military as well as commercial operations of aircraft. His definitions are excellent except that this reviewer fails to see the necessity of some of the coined words used such as "avigation" for "aërial navigation," and "flyings" for "sailings."

The second part is divided into two chapters, one describing charts, maps, instruments, and accessories, the other dealing with the compass. Among the accessories he shows a picture of an aircraft plotter with a brief description. It has been my experience that the aircraft plotter is the most useful device for navigational purposes found in our planes today, and I believe the author could have increased the usefulness of his book by adding a few practical problems on it. The chapter on the compass is excellent without going into the subject too deeply.

Part three deals entirely with dead reckoning. Lieutenant Ramsey believes dead reckoning the most important branch of aërial navigation. He says: "For flights of moderate length, dead reckoning offers as accurate a means of navigation and keeping track of the position as does piloting. For flights of similar character where the time element prevents the taking of a sufficient number of celestial observations to insure an adequate degree of accuracy, dead reckoning is more accurate than navigation by aërial astromony." He gives his reader many interesting practical solutions of dead reckoning problems.

Although emphasizing the importance of dead reckoning, the author has not neglected piloting and aërial astronomy, which are taken up in parts four and five, respectively.

In part six the actual practice of navigating aircraft is discussed. Examples are given to illustrate navigation by piloting, by dead reckoning, and by celestial observations.

Part seven explains the application of aërology to aërial navigation. No attempt is made to elaborate on this subject, only a brief description of weather maps and pilot charts and their relation to aërial navigation being given.

Lieutenant Ramsey deserves much credit for the practical manner in which he has handled his subject. It merits the attention of all aërial navigators.

COMMERCIAL CHROMIUM PLATING. By Richard Schneidewind, Department of Engineering Research, University of Michigan. Menasha, Wisconsin: The George Banta Publishing Company. 1930. $.50.

REVIEWED BY LIEUTENANT F. A. TUSLER *(C.C.), U. S. Navy*

The first deposition of chromium was performed by the electrolysis of its chloride solution by Bunsen in 1854. Genther two years lated found the solution, chromic acid, now used. But it was not until the keen competition among automobile manufacturers for a material of better decorative and protective qualities than nickel that its recent commercial development was brought about. The publication in 1920 of the extensive researches of G. I. Sargent on chromium plating provided a firm foundation on which to build. The advantages of chromium plating over nickel for the above purposes are its greater smoothness, resistance to oxidation and tarnish, better appearance, and, when applied over copper and nickel as successive platings, greater protection of the base metal against corrosion.

The successful deposition of chromium demands more exacting control of plating technique than does nickel or copper. Accurate information in regard to the following factors is essential: (1) temperature of solution in contact with work; (2) current density on surface of work; (3) condition of the surface to be plated; (4) composition of the solution. The relationship of these four factors has been presented by Mr. Schneidewind in a concise yet definite manner which will appeal to the practical plater. The information is based on the plating practices of a large number of firms specializing in this work. Graphical charts indicate the ranges within which the relationship between temperature of solution, current density, and composition of solution may be varied and yet insure "bright metal." The optimum relationship is also clearly indicated.

The information concerning such equipment as motor generators, rheostats, tanks, fume-exhausting apparatus, temperature-control gear, cocks, and anodes, will prove invaluable to those contemplating new installations of equipment; as will also certain data regarding the relative cost of copper, nickel, and chromium plating. The causes of defective plating and means for its correction, the best methods for stripping, cleaning, buffing, and rinsing of the work, and the control of the solution by chemical analysis, have been thoroughly covered. The practical plater will find the answer to many of his problems in this sixty-page circular.

JANE'S FIGHTING SHIPS, 1929. Edited by Oscar Parkes, O.B.E., M.B., Ch.B., and Francis E. McMurtrie, A.I.N.A. London: Sampson Low, Marston and Co., $12.50.

This new issue of *Jane's Fighting Ships* is somewhat larger than its predecessors. It has been thoroughly revised and brought up to date and contains new classes in commission and those laid down and not completed where sufficient information is available. The book is further brought up to date by the addition of a "special late addenda" at the back of the book.

The book contains over 3,000 photographs.

The information given about the navies of each country include the following: flags and uniforms; naval estimates and personnel; classes of ships, with photographs of each class and the names of the ships of the class together with the dates of commissioning; silhouettes of each class.

The photographs and cuts are well done. The silhouettes are very well shown, especially in details.

Due to numerous changes in recent years the bringing up to date of the national and naval flags of the countries makes this section of special interest.

The arrangement and indexing of the book has been well done and the finding of desired information is much facilitated.

The volume is attractive in appearance and is a valuable reference book.

W.S.F.

YOU CAN'T PRINT THAT. By George Seldes. New York: Payson & Clark Ltd. 1929. $4.00.

REVIEWED BY LIEUTENANT COMMANDER P. P. POWELL, *U. S. Navy.*

The author evidently does not intend to again accept a European post because what he tells us about Russia under the Soviets, Italy under Mussolini, and Syria under Sarrail would not make him welcomed at many foreign offices. He tells the truth in a straightforward, interesting manner which makes his book not only entertaining reading but also an authentic source of reference for events back of the scenes in a number of different countries during the past decade.

It has been my good fortune to spend several years on duty in Europe since the war, visiting all countries except Norway, Bulgaria, and Russia, where I was not allowed, and I have made varying degrees of acquaintanceship among many of the characters whom Mr. Seldes mentions. From what I have learned through these contacts and many others both official and social I consider that the author has done a great and good thing for the American public by giving them some idea of what is actually going on in the world which the papers do not reflect. The only trouble is that he has not told enough. I think that I can read between the lines that he knows more. Every naval officer should read this book.

MASTERS' AND MATES' MANUAL OF NAVAL ARCHITECTURE. By George Charles Manning, M.S., Naval Constructor, U. S. Navy. New York: D. Van Nostrand Co., Inc. 1930. $2.75.

REVIEWED BY CAPTAIN HERBERT S. HOWARD (*C.C.*), *U. S. Navy*

The author is also the author of the book entitled *Naval Architecture and Warship Construction* used as a textbook in these subjects at the U, S. Naval Academy. In this new volume Lieutenant Commander Manning presents an abridged and somewhat simplified volume on the subject of naval architecture and naval construction, with the intention, as well set forth in the preface, of making the elements of these subjects available to the operating officers of the merchant marine.

The object of the book is evidently to help the operating officer, master or mate, to a better understanding of his ship, and through this better understanding, to a more efficient performance of his duties and to a higher level in his profession.

The book covers three principal fields: the basic theories of naval architecture and the forms of calculation employed in carrying out these theories, the procedure in carrying through the design of a ship, including the calculations of weight and strength, and a description of the materials, auxiliaries, and systems usually employed in the construction of a merchant type of ship.

While much of the mathematical treatment in the earlier chapters of the book may be found difficult for a merchant officer, a mastery of the questions of change in draft and change in trim under varying conditions of loading and density of water should be of great value, as with a proper understanding of the method of making such a calculation a merchant officer should be able to meet these very problems which must confront him from time to time under actual service conditions. To facilitate the study, a number of carefully worked out problems are given which make the subject more easy to grasp. Similarly a basic understanding of problems of stability which can be gained through the information given in this book will lead to a better knowledge as to the proper loading of a ship.

The chapters in the book describing the methods of construction of a ship may be said to be of somewhat academic interest to an operating officer, but on the other hand such knowledge undoubtedly adds to a merchant officer's better understanding of his ship and a greater interest in his profession. The chapters on class and tonnage and on preservation should be of value to all merchant officers and the information contained therein is in ready and understandable form.

All in all, while the book may in certain respects be somewhat beyond the grasp of some officers in the merchant marine, it contains in ready form valuable information with regard to the design and building of a merchant vessel and her handling in service.

To an ambitious officer this book offers a source of information and knowledge in a more understandable and less lengthy form than in the usual books on naval architecture and ship construction, and should if studied and assimilated, make the officer more fitted to rise in his profession.

Courtesy U. S. Naval Academy Museum

From the original owned by Rear Admiral W. L. Rodgers, son of Admiral Rodgers

FORT MONOCACY

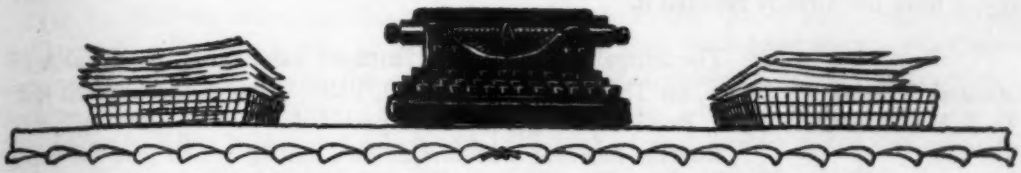
One of the redoubts at Kang Hoa, near Chemulpo, captured by the squadron of Rear Admiral John Rodgers, June 10 and 11, 1871, in retaliation for an unprovoked attack on the launches of the U.S.S. *Monocacy* by Koreans.

UNIV. OF MICH.

From a Photograph at the U. S. Naval Academy

REAR ADMIRAL JOHN RODGERS, U. S. NAVY
The fifth president of the U. S. Naval Institute, 1879-82

SECRETARY'S NOTES



Prize Essay Contest, 1930

At its meeting on February 20, the Board of Control of the U. S. Naval Institute considered the twenty-one essays which had been submitted in competition for the Institute's Prize Essay Award. The essay entitled "Naval Policy at the Crossroads," by Lieutenant Leland P. Lovette, U. S. Navy, was awarded the prize. The Board voted a cash award of $350 in addition to which, under the Constitution and By-Laws of the U. S. Naval Institute, the author will receive a gold medal and life membership in the U. S. Naval Institute.

The essay "Will to Win" by Lieutenant (j.g.) Ernest M. Eller, U. S. Navy, was awarded First Honorable Mention and the Board of Control voted a cash award of $150 to Lieutenant Eller.

The essay "Sea Power and World Unity," by Howard G. Brownson, Ph.D., 896 Twenty-eighth Street, Des Moines, Iowa, was awarded Second Honorable Mention and the Board of Control voted a cash award of $100 to Dr. Brownson.

The essays submitted this year were of a high standard, an especially pleasing feature being that a number of younger officers took part in the contest.

Round Two

The London Conference has been having its troubles. Defeat of the French government delayed meetings for some time, but they are now on again in full force. It is always darkest just before the dawn, and the period just completed has been more than gloomy; however, as none of the conferees wish to bear the onus of defeating the aims of the conference, every effort is being bent towards some sort of an understanding.

The danger of such a situation lies in the fact that a repetition of the Washington Conference may occur: agreement on principles which are not carefully observed. In other words, if the 5-5-3 ratio had been settled at Washington for all classes, the present conference would have been much easier to solve.

There has been too much effort spent on the London Conference for it to fail: some sort of an agreement must be reached. As the Secretary of the Navy has stated, some agreement will be reached, after which it is the duty of the United States to live up to that agreement.

Our mistake

In an article published in the March issue of the PROCEEDINGS, "The Big Little Fighting Vessels," the length of these ships was given as 295 feet 9 inches. This should have been 395 feet 9 inches or thereabouts. The lengths, according to Jane and Brassey, vary from 392.8 feet to 396.6 feet.

Naturally, such an error should not occur, but they sometimes do and the Institute

feels it should correct any wrong impression it may have caused. The error in this case was especially grievous, as the burden of the article was on the point of size.

So in reading the article, please remember that the length is in error one hundred feet, if you have not already realized it.

Annual Meeting U. S. Naval Institute

The annual meeting of the Institute was held at the Naval Academy, on Thursday, February 20, 1930. Rear Admiral S. S. Robison, President of the Institute, presided.

Routine business was carried out, among which was the report of the tellers on the election of the officers of the Naval Institute. The present officers of the Institute were returned to office. In this connection, nearly half of those entitled to vote sent in their ballots.

The result of the Prize Essay contest was announced.

The report of the Secretary-Treasurer and the financial statement will be found further on in these notes.

The members of the Institute present voted their approval of the conduct of the business of the Institute for the past year.

Naval Historical Foundation

In the Secretary's Notes of March, mention was made of the business of the Naval Historical Foundation. Since then, we have received additional information as to the progress of this organization.

The Society of Sponsors of the United States Navy has been lending moral support and financial assistance to the Foundation almost since its inception and continues to do so. A worthy action by a worthy association.

The following memorandum by Rear Admiral W. L. Rodgers, President of the Foundation, gives us an idea of what the Foundation is doing:

"Members and friends of the Naval Historical Foundation and all patriotic citizens of the United States may be interested to know that this organization, which was founded in March, 1926, through the efforts of a few officers of the Navy, primarily for the purpose of rescuing matters of historical interest, which might otherwise be destroyed or lost, has already become of considerable importance to the Navy and to the country at large, as evinced by the numerous requests for information, for the loan of books, manuscripts, and letters, and for permission to publish copies of photographs and paintings. These requests come from the Navy Department Library and from authors and publishers from various parts of the country.

"The accessions to the Foundation, which now exceed one hundred donations, contain books, papers, letters, scrap books, journals, letter books, photographs, prints, paintings, and relics. In the list are whole collections from old naval families such as Luce, Rodgers, Selfridge, Watson, Casey, La Vallette, Wise, and Horner.

"There is much in this collection which cannot be found anywhere else in the world, as much of it consists of the private letters of men who have made United States naval history.

"Among other notable features are the original letter book of Lieutenant Commander J. H. Dent, which was captured at Washington in 1814 by the British and which was purchased by the Foundation in London last year; a History of the U. S. Revenue Cutter Service, which is probably the most complete and authentic history of that service in existence; a collection of copies of old ships' logs of the time of the American Revolution,

obtained by Mr. William B. Clark in London and presented to the Foundation; and a collection of World War paintings by the artist Burnell Poole, presented to the Foundation by the E. I. du Pont de Nemours and Company, Inc.

"The La Vallette collection which was loaned to the Foundation contains such valuable and interesting items as a note book containing pages from the logs of the frigates *Guerriere* and *United States;* also the dimensions of the *Macedonian, Congress, Prometheus, Independence, President, North Carolina,* and *Columbus.* This collection also contains logs, journals, letter books, and note books 1818-1855 of such vessels as the *Constitution,* the schooner *Fox,* the *Fairfield,* the *Independence,* the *Ohio,* and the *Congress.*

"The Luce collection contains note books, journals, letter books, and the professional correspondence of Admiral Stephen B. Luce covering the period 1842 to 1917.

"The Selfridge collection contains professional journals and letter books, covering the period 1816 to 1883.

"The Horner collection contains professional journals, letter books, and correspondence of Surgeon G. R. B. Horner, U. S. Navy, covering the period 1826 to 1842.

"In looking over the list it seems quite evident that there is a growing sentiment that the Naval Historical Foundation is a better place for the family professional archives than either the garret or the storage warehouse and also that some friends who have nothing to add to the collection have had some success in interesting others who have."

Again let us remind you that if you have papers or records of historical naval value, arrange with the Foundation for their preservation.

The New Dutton

Navigation and Nautical Astronomy, by Captain Dutton, has reached its third printing. It is now available for distribution. Three printings since its début in 1926 is a fine record for any book.

The book has been slightly revised, errors eliminated (but others are bound to creep in), a little different treating of some subjects, and a description of the use of *H.O. 208* (Dreisonstok's Tables).

All told, the book is the latest thing on the subject of navigation. The price has been reduced to $4.50 per copy, postpaid, 10 per cent off to members of the Naval Institute. This reduction has been made possible by its large sales. Orders for four hundred copies of the book were waiting its release.

"Watch Officer's Guide"

Work is progressing on this book. The work of getting the latest information as to flags, preparing color plates, etc., is holding up the book but it will be ready before long. We honestly feel that this book should be had by every one responsible for the handling of a ship, whether he is in the naval service or not.

Of course, a good deal of the subject matter applies to service vessels, but a lot applies to any type of ship.

We are keeping it down to pocket size, so you can have it with you when you take the deck. Better order one!

Annual report of the Secretary-Treasurer

Admiral Robison and gentlemen of the Naval Institute:

The Secretary-Treasurer of the Naval Institute submits the following report on the business of the Institute for 1929.

Summarizing the business as a whole, it might be said that the results for the year were fair. There has been an increase of membership which indi-

cates a healthy interest in the PROCEEDINGS, there has been an increase in business and profits which indicates a certain amount of efficiency in running the business of the Institute, and, from the number of articles that are being submitted, the PROCEEDINGS seems to be considered an excellent medium for the expression of service thought.

We will consider the Institute from three angles, namely, membership, PROCEEDINGS, and book publishing.

In connection with the membership during the year 1929, 830 new members were added to the list. There were 49 deaths, 190 resignations, and 131 dropped, leaving a net gain in membership of 460. Although this is a fair gain, it is not believed that it is all that should have been expected for considerable effort has been made to attract people interested in nautical affairs to membership in the Institute. Our experience has been that the best way to increase our membership is by personal nominations made by our present members. This seems to be more effective and produces more new members than any other method. It is urged that the members of the Institute continue to send in nominations of friends who would probably be interested in nautical affairs.

Our total circulation at the present time is over 7,500 copies of the PROCEEDINGS each month, which is some 500 better than last year at this time. This corresponds with the increase in membership. There have been three special issues of the PROCEEDINGS during the last year, namely, the Coast Guard issue, the Special Information number, and an Aviation number. The Coast Guard issue was especially well received, some 12,000 copies of this issue having been distributed. Six thousand reprints of the Special Information number were distributed in addition to the regular circulation of our membership. The PROCEEDINGS, as a whole, seems to attract favorable comment and we believe that the growth, although slow, will be sure.

In regard to the publishing end of the Institute's business, during the last year we published seven new books, and reprinted twelve books and so-called pamphlets. All told, some 35,000 copies of books and pamphlets were printed during the year which corresponds favorably with the work done last year.

During the last year a discount of 10 per cent has been allowed to members on books published by the Institute. The sales of Institute publications, other than the PROCEEDINGS, have increased $8,000, which we believe is to some extent due to this policy.

The operating loss, i.e., the cost of running the business of the Institute, for the year 1929 was approximately $500. The interest on bonds and bank accounts was approximately $9,000, so that the net profit to the Naval Institute was about $8,500. This amount has been invested in additional bonds.

The business of the Naval Institute was audited by Black and Company, certified public accountants, of Baltimore, Maryland. Their statement of the audit follows. It will be noted from this statement that the income from advertisements decreased about $900 but this was offset by a decrease in the loss on the PROCEEDINGS of $1,300. There was also a decrease of $1,100 in profits on Institute publications, other than the PROCEEDINGS, but this was offset by a corresponding decrease in operating expenses of $1,100.

The Secretary feels that although the result of the year's work can be considered satisfactory, yet it is not all that we had hoped for nor all that we should try for. We will endeavor to increase the membership and business for the coming year and we hope that all members will coöperate in helping to attain our end.